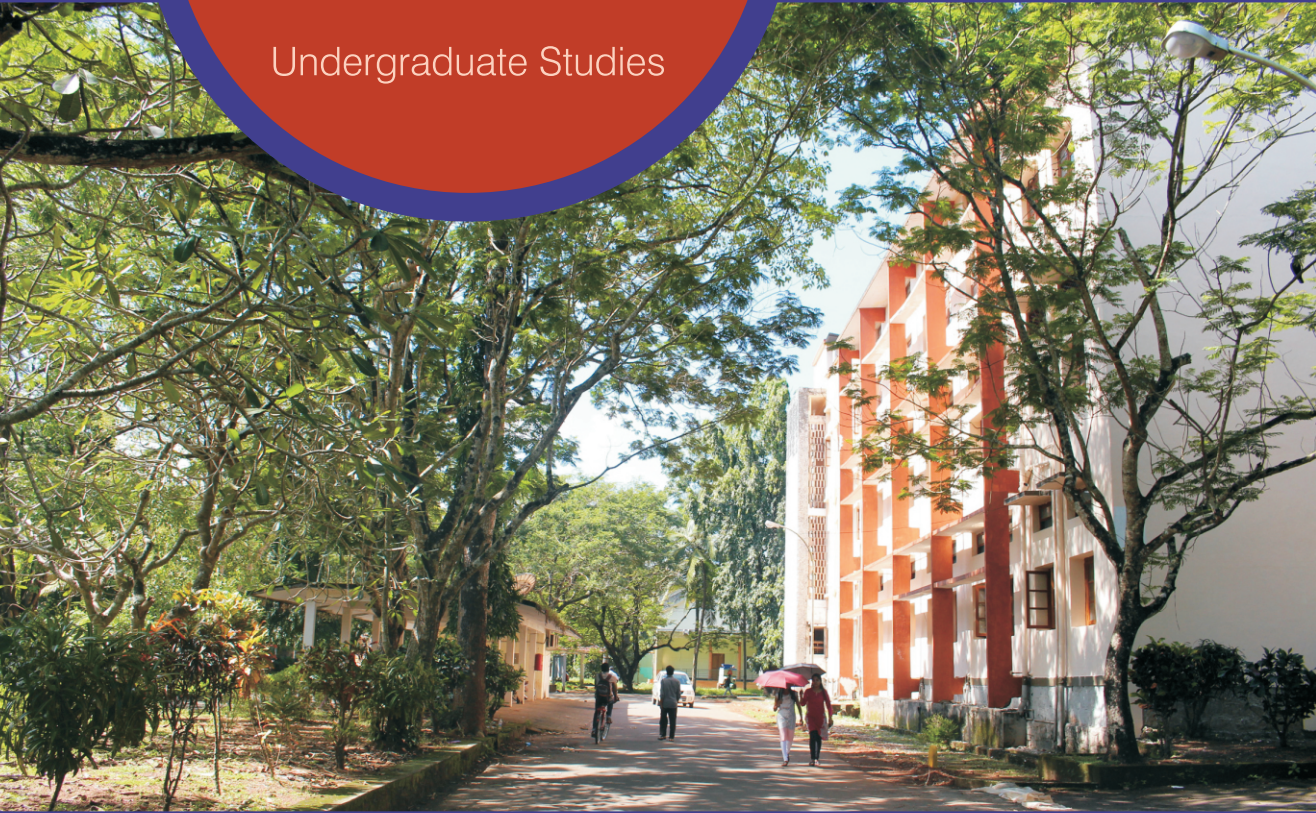2019-20

STUDENT
HANDBOOK

Undergraduate Studies

राष्ट्रीय प्रौद्योगिकी संस्थान कालिकट

National Institute of
Technology Calicut

VISION

International standing of the highest calibre.

MISSION

To develop high quality technical education and personnel with a sound footing on basic engineering principles, technical and managerial skills, innovative research capabilities and exemplary professional conduct to lead and to use technology for the progress of mankind, adapting themselves to the changing technological environment with the highest ethical values as the inner strength.

STUDENT HANDBOOK
Undergraduate Studies 2019-'20

National Institute of Technology Calicut

Institution of National Importance under NIT Act, 2007
N.I.T. Campus P.O., Calicut - 673601, Kerala, India
Phone +91-495-2286101, Fax: +91-495-2287250
www.nitc.ac.in

CONTENTS

1 INSTITUTE PROFILE

National Institute of Technology Calicut (NITC) is one of the 31 institutions of national importance under the NIT Act 2007 and is fully funded by the Government of India. The mandate of the Institute is to provide higher technical education and conduct research in the various branches of Engineering, Science, Technology and Management. Originally established in 1961 as a Regional Engineering College (REC), it was transformed into a National Institute of Technology in the year 2002. Institute offers bachelors, masters and doctoral degree programs in Engineering, Science, Technology and Management. With its proactive collaborations with a multitude of research organizations, academic institutions and industries, the institute has set a new style for its functioning under the NIT regime.

NIT Calicut is an academically autonomous institute governed by the NIT Act 2007. The President of India is the visitor to the Institute under the act. The governance structure includes the national council for NITs as the apex policy making body, while the Institute's governance is vested with a board of governors. Institute's senate is the authority in academic matters. Chairman of the board of governors is nominated by the visitor. The broad based governance and administrative system given under the NIT Act ensures participative decision making and assures accountability.

Set in a picturesque landscape at the foothills of the Western Ghats, NITC is located about 22 kilometers north - east of Calicut City. It stretches over a length of about 1.5 Kilometers along the Calicut-Mukkam road, extending over an area of approximately 120 hectares. Being a fully residential institution, the campus houses academic buildings, research labs, hostels, residences and other amenities among its infrastructure. The Institute is presently offering 11 UG programs with a total intake of 1279 and 30 PG programs including MBA with a total intake of 673. Doctoral level research has remarkably increased in the recent times, with over 500 research scholars registered and there has also been a substantial increase in the volume of research papers and patents produced.

1.1 ADMINISTRATION

Director	Dr. Sivaji Chakravorti
Registrar	Lt. Col. Pankajakshan K. (Retd.)

Deans

Academic	Dr. P. S. Sathidevi
Planning and Development	Dr. M.V. L. R. Anjaneyulu
Research and Consultancy	Dr. Ashok S.
Faculty Welfare	Dr. T. M. Madhavan Pillai
Students Welfare	Dr. S. D. Madhu Kumar
Alumni Affairs and International Relations	Dr. Jeevamma Jacob

Associate Deans

Academic	Dr. Harikrishna M.
Academic	Dr. Subhasree M.
Planning and Development	Dr. Gopakumar G.
Planning and Development	Dr. K. Krishnamurthy
Research and Consultancy	Dr. Arun P.
Faculty Welfare	Dr. P.K. Madhavan Unni
Students Welfare	Dr. Mohammed Firoz. C.
Alumni Affairs and International Relations	Dr. Shijo Thomas

Chairpersons

Postgraduate Admissions	Dr. Deepthi P. P.
Undergraduate Admissions	Dr. K. A. Abdul Nazeer
Education Technology and Library	Dr. Rijil Ramchand
Chief Warden	Dr. A. Santhiagu
Professor & Head of Training and Placement	Dr. Sameer S. M.
TEQIP Coordinator	Dr. Abraham T. Mathew

Deputy Chairpersons

Postgraduate Admissions	Dr. Sajith V. & Dr. Vineesh Ravi
Undergraduate Admissions	Dr. George K. Varghese
Education Technology and Library	Dr. Vinay V. Panicker

TEQIP Project Manager	Dr. Sajith A.S.
SC/ST Liaison Officer	Dr. T. M. Madhavan Pillai

First Year Coordinator	Dr. Dhanaraj K. J.
	Office: Ground Floor, East Campus Lecture Complex
	Phone: 0495-228 6197, 6710

Deputy Registrar/ Officer on Special Duty

Deputy Registrar (Academic)	Sri. Gejo C. V.
OSD (Stores &Purchase)	Sri. K.M. Muralikrishnan

Librarian (i/c)	Smt. Sweety Mathew

1.2   LOCATION

Set in a picturesque landscape at the foothills of the Western Ghats, NIT Calicut is located about 22 kilometres north-east of Kozhikode city in the state of Kerala, India. Calicut, also known as Kozhikode, located in the Malabar region of Kerala State, found a place in the world history with the discovery of a sea route to India in 1498 by the Portuguese navigator Vasco Da Gama. Basking in the idyllic setting of the Arabian Sea on the west and the proud peaks of the Wayanad hills on the east, Calicut is known for its serene beaches, lush green countryside, historic sites, calm backwaters, wildlife sanctuaries, rivers and waterfalls.

The campus of National Institute of Technology Calicut stretches over a length of about 1.5 km along the *Calicut-Mukkam* Road, extending over an area of approximately 120 hectares. NITC is connected with Calicut city by KSRTC Buses (towards *Mukkam*) starting from KSRTC Central Bus Station and by Private Buses starting from Corporation Bus Station, *Palayam* (near Calicut Railway Station). Taxi and auto-rickshaws are available from Calicut Railway/Bus Station to NITC. The nearest airport is at *Karipur* near Calicut, which is 45 kms from the Institute.One can reach the campus by car from Kozhikode International Airportin approximately 45 minutes. Kozhikode railway station is 23 kilometers away. Local buses are available frequently for commutation between campus and the main city.

1.3   INFRASTRUCTURE FACILITIES

The Institute has a well-equipped library, a computer centre, lecture hall complexes, various laboratories in different departments, workshops, and hostels for accommodating about 5000 students, health care centre, and adequate facilities for sports, games and co-curricular activities. The institute has a guesthouse, with A/C and non A/C rooms, for the guests of the institute, including alumni and parents of the students. To provide service to the residents, the campus also accommodates a branch of State Bank of India, Post Office, Canteen and Co-operative Store.

Campus Networking Centre

The Campus Networking Centre (CNC) is the central facility providing the software, hardware and networking support to the entire student and staff community of NITC Campus. CNC manages the internet connectivity (both wired and wireless), IP phones and provide hardware, software and all other IT related solutions for the entire Institute. The campus is interconnected with about 30 kms of fibre optic backbone network with 80 routed internal networks, managed by the Unified Threat Management System. The centre is equipped with Firewall, Authentication Server, Log Analyser, Routers, Core Distribution switches, Domain Name Server, Web Servers, Proxy Servers, Antivirus central server and IP phone server etc. Presently the network is served by 1Gbps of Internet connectivity provided by BSNL under NKN scheme of MHRD and 20 Mbps by RELIANCE. The hostels are served with Internet connectivity through wired and wireless mode. CNC functions on a 24x7 basis, 365 days without any holidays. IP phones are installed in all academic and administrative sections. The IP Phones and IP Phone server are also implemented, configured and managed by CNC.

Hardware maintenance unit of CNC provides quality service support to minimize system downtime in the entire campus. The services include installation, troubleshooting and maintenance of computer and peripheral devices, software, and operating system installations.

Education Technology and Library

Education Technology & Library (ETL) consist of Central Library and Digital Library. The central Library of NIT Calicut is one of the best technical libraries in South India.

It came into being with the establishment of the college in 1961. Central Library is having a floor of 1490 m^2. It has a very good collection of more than one lakh technical/scientific books. The services of the Central Library are fully automated using KOHA, and the entire collection is accessible throughout the campus. Using KOHA OPAC, users can search the library online catalogue by Author, Title, Subject and Keywords.

The library management software along with existing campus-wide intranet imparts the following features:

- Automated front-desk operations.
- Campus wide online access, catalogue access.
- RFID-based automated collection/bar-coded user identification.

Central Library subscribes reputed International Journals and Indian Journals in online and print forms.

The Digital Library, **'NALANDA'** provides online access to more than 6000 electronic journals in various Engineering and Science disciplines. NALANDA hosts many electronics data bases in its servers. As a member of the ShodhSindhu Consortium under Ministry of Human Resource Development, GOI, NALANDA promotes the use of e-journals and e-books for advanced research and learning in the Engineering and science Education. Major online resources are journal / magazine / conference records / standards of IEE, IEEE, Springer, ASME, ASCE, and ACM Digital Library core packages. Online access to study materials is available through a local copy of NPTEL. Resources like CMIE, ACE Analyzer, Eikon, Grammarly, Knimbus, Emerald, J Gate, Scopus, and Web of Science are available to the NITC community through the digital library. Library also subscribes to plagiarism checker - Turnitin. The digital library is developing the NITC resources by collecting and indexing the students" project reports / theses through an ETD run with DSpace, which also houses the national and international standards. Eduserver - running in the Digital Library - hosts the moodle platform for online course management. E-books from Wiley, Springer and Pearson are also made available.

Digital Library reading room housing about 50 computer terminals provides exclusive access to the online resources. All resources are available throughout the campus from http://www.library.nitc.ac.in.

There is a separate section for SC/ST students, funded by the Institute as well as Kerala State Govt. Scheduled Caste Welfare Department.

An air-conditioned study room, with CCTV surveillance, is functional for the Institute's user community. Here users are permitted to bring their personal books, laptops and other study materials for self-study. The Central Library also houses a Reprographic section which consists of a Graphic Studio, Offset press and a Binding Section. These sections cater to the related needs of the Institute. NITC Central Library offers a powerful combination of traditional resources, sophisticated technology, and well-designed spaces to support learning, teaching and scholarship, along with friendly and knowledgeable staff to assist in using these tools and collections.

Working Hours: Library remains open from 8 am to 11 pm on all working days. It remains closed on Sundays and Institute holidays. Working hours of Study Room is from 9 am to 11 pm on all days, including holidays.

Central Computer Centre

Central Computer Centre (CCC) is the central facility in NIT Calicut which caters for the computing requirements of the whole community of this institution. The Centre has state of the art infrastructure with three fully operational terminals spanning over two floors of the building. Decision Support System (DSS) of the institute also operate from the Computer Centre building. The Centre has more than 200 client machines and 30 workstations for usage. CCC hosts some of the high end servers and a parallel processing cluster machine. Servers include four DELL PowerEdge T620 which has a dual Hexa-core processor and HP ProLiant Rack server which has a dual Quad-core processor.

A state of the art Super Computing Facility with 205 Tera FLOPS computing power meet the research needs of the Institute. This Hybrid cluster contains 1 master node and 13 compute nodes are interconnected through infiniband. Six out of thirteen compute nodes are GPU enabled. Each GPU compute nodes contains 2 Tesla K20 GPU cards. All Compute nodes carry dual E5-2640 Intel chip as processors. The Facility can be accessible by all the departments and schools anywhere in the campus through networking. Post graduate, Ph.D scholars and UG students (those who have computationally intensive projects) are using this facility for research activities.

Some of the computational software's and packages for the different departments run from the servers maintained in the CCC as well. The centre possesses a bundle of software, packages for diversified applications. Centre is fully air-conditioned and has UPS power backup for the whole setup. The Centre works 16 hours a day (7am – 12am) 7 days a week except national holidays unless instructed otherwise.

1.4   HOSTELS

There are 11 hostels for men and two hostels for women. The total capacity of all hostels currently available is more than 5000. All the hostels have Common room and Recreational centre where newspapers, magazines, TVs and indoor sports/ games facilities are available. Guest room facilities are available in each hostel for the relatives/ guests of hostel inmates on chargeable basis. Twenty four hour internet and computational facilities are available in almost all hostels; it is getting extended to other hostels too. A new mega hostel for boys is getting ready for occupation. Twenty four hours water and electricity supply is ensured in all the hostels. Mini canteen, Milma, Amul kiosks, DTP centre, co-operative store, book centre, laundry, etc., are functioning in the Students Amenity Centre functioning near the Hostels.

There are 11 messes serving food with wide varieties of menu, associated with men's hostels out of which, two are dedicated vegetarian messes. Four messes in the ladies hostel cater to the varying tastes of students from all over India**. All the students except first year students are allowed to join any of the messes of their choice**. However, dining from any one of the messes within the hostel premises is compulsory for the inmates. Apart from the main messes, optional night mess services are available till midnight in the hostels enabling students to take tiffin and snacks during their overnight studies. To

provide calm and favourable environment for the students, the inmates of hostels are strictly instructed to follow the code of conduct of NITC Hostels.

The ladies hostel has facilities like ladies gym, stitching and tailoring centre, hostel library, indoor sports centre, DTP centre, Ice cream shop, Co-operative store, etc. A night canteen and an Amul kiosk function in Ladies hostel as well.

Hostel fee structure

Sl. No.	Description	Amount (Rs.)			
		UG		**PG**	**Ph.D.**
		General / OEC*	**Kerala SC/ST**		
1	Cost of Application Form	500/-	250/-	500/-	500/-
2	Hostel Amenities Fund (Non-refundable)	4,500/-	2,750/-	4,500/-	4,500/-
3	Caution and Furniture Deposit (Refundable at the end of the programme on production of Non-Liability certificate)	10,000/-	2,000/-	10,000/-	10,000/-
	Total	**15,000/-**	**5,000/-**	**15,000/-**	**15,000/-**

  * Caution Deposit of Rs. 10,000/- will be refunded later for eligible OEC students.
  # The financial requirements given above are subject to change.

Hostel and mess monthly charges
    Hostel room rent, electricity charge, water charge, mess and other establishment charges are payable on monthly basis
  ➢ Hostel charges including rent, water charge, electricity charge, etc will be approximately Rs. 1000/- per month.
  ➢ Mess charges will be based on the type of mess and the quantity of extra items consumed by the student and will be approximately Rs. 3,500/- per month.
    However, parents/students can pay an amount of Rs. 20,000/- at the beginning of every semester as an advance against both hostel and mess charges. If found excess, balance amount will be carries over to the next semester.

Mode of payment (Cash payment is not acceptable)
  ➢ Online payment using "State Bank Collect" Printout of the transaction statement shall be submitted to the hostel office.
    Use link: *http://www.onlinesbi.com/prelogin/icollecthome.htm?corpID=366005*
    (select appropriate category of fee)

Hospital & Healthcare Facilities
Medical care is offered by the Institute at its own Health Centre having 10 beds and a clinical laboratory for routine biochemical tests. There are two medical officers - a Lady Medical Officer and a Resident Medical Officer - and qualified nursing staff to look after the health needs of the campus residents. Institute, through insurance firms, offer a mediclaim policy for the students which offer up to Rs.1,00,000 for hospitalization for a nominal premium paid by the students.

Banking and Postal Facility

A fully computerized branch of the State Bank of India (SBI) with networked ATM and internet core banking facility functions within the campus. The bank also extends financial support in the form of loans for meeting the educational expenses of students. A Post Office with value added facilities like Speed Post functions within the campus.

Mobile Communication Services

All major service providers provide mobile phone coverage in the campus. BSNL Telephone Exchange also is functioning inside the campus.

Engineering Unit

The construction, renovation and maintenance of buildings, compound wall, laying of roads, water supply, allotment of residence, campus electricity distribution and maintenance etc. are carried out by the Engineering Unit.

Guest House

Guest house facility is available in the campus for the guests of the Institute which is extended to relatives of staff and students based on specific requests.

Transportation Facility

The Institute provides facility for transportation to the city by operating bus services for the campus community in the morning and evening. Bus facility is also provided during lunch-break from the East campus towards ladies hostel area. In addition, vehicle service is provided at frequent intervals connecting various locations in the campus for the benefit of the students.

Other facilities

Apart from those mentioned above, there are many facilities provided in the campus aimed at improving the academic environment in the campus and also for the holistic development of the students.

Student Guidance Cell (SGC)

The Student Guidance Cell aims to provide guidance and counselling services to students based on their needs with assured privacy and confidential exchange of communication. SGC also provides academic support in the form of special classes for students. The formation of SGC was based on the feedback from graduated students of the Institute who stressed on the need to have a facility to counsel and motivate the students. SGC helps the students to function better in all domains of life – academic, social, personal and psychological. The motive behind SGC stems from the need to facilitate the process of growth and maintain a positive well-being of the students. The counselling services offered by SGC empowers the students to have enhanced ability to solve problems, make decisions, as well as, make them more efficient in tackling personal problems. In a nut shell, it is aimed at enhancing their ability to utilise to the best, the potential available in them. The SGC avails the help of two trained clinical psychologists who are available in the institute. The Clinical Psychologists are available in Room No MB 204 (Old admission room in Main Building) as per the following timings: Monday to Friday: 9:00 am to 1 pm & 2 pm to 5.30 pm. Contact No. 0495-228-6180. Website: www.sgc.nitc.ac.in. Email: *sgc@nitc.ac.in*

Centre for Value Education (CVE)

NIT Calicut gives its students a unique opportunity to engage in activities that promote human values. A one credit course on value education is an academic requirement in the NIT curriculum.

Physical Education and Sports

NIT Calicut, true to its objective of "total fitness in the campus", has rightly included Physical Education

in the UG curriculum, which is designed to orient the fresh batch of students to the basic need for health related physical fitness through sports and to compulsorily participate in a 1-Credit Course in Physical Education. The Institute offers to the students all major infrastructure including Swimming Pool, Skating Rink and Gymnasium to choose from, for making their campus life worthwhile and fruitful. In addition, the highly talented are spotted, trained and exposed to higher level of competition like the Inter-university, Inter-NIT and State tournaments.

National Service Scheme (NSS)

NIT Calicut has a National Service Scheme Cell operating under the Kerala State NSS Cell, with four NSS units. Volunteers are encouraged to take up socially relevant activities outside the campus, specifically in the Chathamangalam Panchayath adopted by the Cell. NSS is part of the UG curriculum and every student has to successfully undergo a one credit NSS programme before he or she enters the fifth semester.

Technical Education Quality Improvement Programme (TEQIP)

NIT Calicut is a participant institute in Technical Education Quality Improvement Programme Phase III (TEQIP-III) Government of India. The Institute has been selected as a mentor institute (sub component 1.3) in twinning arrangement and assigned Govt. Engineering College Bharatpur, Rajasthan (sub component 1.1) (www.ecbharatpur.ac.in) as a mentee institute. The key areas include knowledge transfer, exchange of experience, optimizing the use of resources and developing long-term strategic partnerships.

Centre for Transportation Research

The Centre for Transportation Research (CTR) was set up in 2013 with funding by Ministry of Human Resource Development under scheme 'Establishment of 50 centres of excellence for Training and Research in Frontier Areas of Science and Technology scheme' (FAST scheme). The mission of Centre for Transportation Research is to improve the quality of life in our community, region and nation through leadership and excellence in transportation research, education and outreach using all the resources and strong partnership with government and industry. The CTR carries out research, training, testing and public awareness programmes in various aspects of transportation engineering.

NCC Unit

National Cadet Corps (NCC) is the largest organization in the country with an aim to shape thousands of young men and women into responsible, alert, disciplined, strong and highly motivated citizens of our country. It inculcates a sense of commitment to the values of national integration, secularism, nationalism and social welfare and awareness in young minds.

The Institute has an NCC (Naval Wing) Sub Unit w.e.f. 11.10.2018 under 9 Kerala Naval NCC Unit, Kozhikode with a maximum of 40 cadets including girls. 30% of the strength (12 positions) is reserved for girl students. Enrolment is purely based on willingness. Preference will be given to the students who are proficient in swimming. The selection is based on the physical and mental fitness among the students who have expressed their desire to join NCC.

Cadets can be in NCC for a maximum period of three years. Each year, parade consisting of ground training and technical subject classes will be conducted. The parade sessions will be planned in such a way that the academic schedule will not be disturbed. Further, the cadets are required to attend Camps and participate in the Examinations. At present 14 cadets completed their first year. A fresh enrolment for another 13 positions will be conducted during Aug-Sep 2019.

1.5   ACADEMIC DEPARTMENTS AND FACULTY MEMBERS

B.Tech. Programmes (4 years - 8 semesters)

    Biotechnology (BT)
    Chemical Engineering (CH)
    Civil Engineering (CE)
    Computer Science and Engineering (CS)
    Electrical & Electronics Engineering (EE)
    Electronics & Communication Engineering (EC)
    Engineering Physics (EP)
    Mechanical Engineering (ME)
    Production Engineering (PE)
    Materials Science and Engineering(MT)

B. Arch. Programme (5 years - 10 semesters) Recognized by the Council of Architecture

FACULTY MEMBERS AND THEIR AREAS OF SPECIALISATION/ INTEREST

Name and Designation	Areas of Specialization/ Interest
Director Dr. Sivaji Chakravorti Ph.D. (Jadavpur University)	High Voltage Engineering

Department of Architecture & Planning

Name and Designation	Areas of Specialization/ Interest
Professor & Head Dr. Anil Kumar P. P. Ph.D. (IIT Madras)	Urban Planning, Smart City Planning, Infrastructural Planning, Sustainable Green Development of Urban Areas.
Professors Dr. Kasthurba A. K. Ph.D. (IIT Madras)	Building Materials, Architectural Conservation, Sustainable Building Technology and Environment Planning.
Dr. Naseer M. A. Ph.D. (IIT Kharagpur)	Urban Planning, Transportation Planning, Remote Sensing & GIS Applications in Urban Planning, Sustainable Building construction, Thermal Comfort Studies in buildings.
Assistant Professors Dr. Bimal P. Ph.D.(NIT Calicut)	Urban Planning, GIS Applications, Parametric Design, Urban Simulations, Smart city, Internet of Things.
Dr. Chithra K. Ph.D. (NIT Calicut)	Architectural Design, Environmental Planning, Land-use Impact Studies, Green Building Rating system.
Dr. Mohammed Firoz C. Ph.D. (IIT Kharagpur)	Urban and Regional Planning, Urban design, Architecture Design.
Dr. Anjana Bhagyanathan Ph.D. (NIT Calicut)	Landscape Architecture, GIS Application in Ecological Planning, Nature Conservation, Indigenous Ecological Knowledge and Architecture.
Dr. Deepthi Bendi Ph.D.(University of Salford Manchester, UK)	Offsite construction/Prefab, Construction process efficiency, Advanced Construction Technology, Sustainable Build Environment, Waste Minimization in Construction.

Dr. Shyni
Ph.D. (IIT Kharakpur)   Housing, Disaster Management, Post Disaster Reconstruction.

School of Biotechnology

Professor & Head
Dr. Rajanikant G. K.
Ph.D. (Manipal University,   In-silico Drug design, Wound healing, Neuroprotection and
Karnataka)   Stroke

Professors
Dr. Md. Anaul Kabir   Gene Regulation in Yeast *Saccharomyces cerevisiae* and
Ph.D. (IIT Bombay)   opportunistic fungal pathogen *Candida albicans,* Protein
                                          folding in yeast and higher eukaryotes

Dr. A. Santhiagu   Microbial Production of Enzymes, Antibiotics, Biopolymers,
Ph.D. (IIT-BHU)   Vitamins, Bio-Chemicals and Strain Improvement through
                                          recombinant techniques.

Associate Professors
Dr. Suchithra T. V.   Enzymology: Isozymes, Diabetology, Microbial fuel cells,
Ph.D. (University of Calicut)   Antibiotic resistance

Dr. K. Rathinasamy   Anticancer Drugs, Motor Proteins, Cytoskeleton, Apoptosis
Ph.D. (IIT Bombay)

Assistant Professors
Dr. Prem Raj P.   Proteomics & Genomics, Microbiology, Animal Physiology,
Ph.D. (Jamia Hamdard, New Delhi)   Bio-Chemistry

Dr. Suresh P. S.   Endocrine cancers, Signal transduction and Reproductive
Ph.D. (IISc Bangalore)   Endocrinology

Dr. Baiju G. Nair
Dr. of Engg. (GSNISS, Japan)   Tissue Engineering & Bio-nanotechnology

Department of Chemical Engineering

Associate Professor & Head
Dr. Lity Alen Varghese   Polymer Technology, Environmental Engineering, Heat
Ph.D. (CUSAT)   Transfer

Professors
Dr. Shiny Joseph
Ph.D. (IIT Madras)   Catalysis and Adsorption, Mass Transfer, Renewable Energy

                                          Adsorption, Inversed Fluidized Bed Reactor, Biodiesel
Dr. V. Sivasubramanian   production, Biogas, CFD studies in food processing and
Ph.D. (Anna University,Chennai)   preservation.

Assistant Professors
Dr. Aparna K.   Microwave Heating, Heat Transfer, Effluent treatment,
Ph.D. (IIT Madras)   Process control

Dr. S.Bhuvaneshwari Ph.D.(NIT Calicut)	Biochemical Engineering, Waste water treatment, Separation Processes.
Dr. K. Haribabu Ph.D.(NIT Calicut)	Effluent Treatment using IFBR, Energy and Environment, Computational Fluid Dynamics.
Dr. Malladi Pavan Kumar Ph.D. (IIT Kanpur)	Design, Modelling, Simulation and Control, Separation Processes
Dr. Vineesh Ravi Ph.D. (NIT Calicut)	Fuel Cells, Process modeling and Simulation Process Control.
Dr. Chandra Shekar Bestha Ph.D. (IIT Madras)	Control Systems, Nonlinear Systems and Analysis, Design and Analysis of Biological Systems, Process Intensification, Process Systems Engineering.
Dr. Sudev Das Ph.D. (NIT Agartala)	Micro- and Nano-scale Phase Change Heat Transfer, Fabrication and Synthesis of Micro/Nanostructure Surface for High Heat Flux Application.
Dr. Noel Jacob Kaleekkal Ph.D. (Anna University, Chennai)	Membrane Based Separations, Carbon Based Materials, Bio-Materials
Dr. Panneerselvam Ranganathan Ph.D. (CUSAT, Cochin)	Chemical Reactor Modelling, Computational Flow Modelling, Techno-economic Analysis and Life-cycle Assessment
Dr. Teja Reddy Vakamalla Ph.D. (IIT Hyderabad)	Computational Fluid Dynamics, Mineral Processing, Multiphase Flow, Tomography, Fluidization, Rheology Modelling
Dr. Prasanna Kumar S. Mural Ph.D. (IISc Bangalore)	Soft Matter, Poly Nanocomposite, Surface Chemistry, Thermal Conductivity, Membrane Separation Technology.
Dr. Susmita Das Ph.D. (IIT Kanpur)	Fracture of Soft Matter, Nanotechnology and Environmental Engineering, Micro Fluidic Devices.
Dr. Dhanya Ram V Ph.D.(IIT Madras)	Process Control, Process Modeling and Design, System Identification, Soft Sensor Modeling.

Department of Chemistry

Associate Professor & Head

Dr. Parameswaran Pattiyil Ph.D. (University of Hyderabad)	Theoretical & Computational Chemistry

Professors

Dr. G. Unnikrishnan (HAG) Ph.D. (M.G. University)	Macromolecular Science & Technology
Dr. Lisa Sreejith M.Phil, Ph.D. (AMU)	Biomedical applications of Surface Chemistry, Waste-to-energy management, Green Technologies

Synthesis and Application of Nano structured Materials,

Dr. N. Sandhyarani (Adjunct Faculty)   Biosensors, Surface Chemistry
Ph.D. (IIT Madras)

Associate Professors
Dr. Lakshmi C.
Ph.D. (IICT Hyderabad)   Organic & Bio-Organic Chemistry

Dr. A. Sujith
Ph.D. (NIT Calicut)   Polymer Science & Technology

Dr. Soney Varghese (Adjunct faculty)
Ph.D. (Eindhoven University,   Liquid Crystal Displays
Netherlands)

Assistant Professors
Dr. Suni Vasudevan   Bio-inorganic Chemistry, DNA binding metal complexes,
Ph.D. (CUSAT)   Luminescent Lanthanides

Dr. Raju Dey
Ph.D.(IACS,Kolkata)   Organic Synthesis, Organometallics and Catalysis

Dr. Mini Mol M
Ph.D. (Sungkyunkwan University,   Nano structured materials for energy, sensors & flexible
South Korea)   electronics

Dr. Janardhan Banothu
Ph.D. (NIT Warangal)   Heterocyclic Chemistry and Medicinal chemistry

Dr. Muniyandi Sankaralingam
Ph.D.(Bharathidasan   Bioinorganic& Biomimetic Chemistry, Synthetic Inorganic
University,Trichy)   Chemistry, Catalysis, Small Molecule Activation

Department of Civil Engineering

Professor & Head
Dr. Sudhakumar J.
Ph.D. (IIT Madras)   Building Technology & Construction Management

Professors
Dr. Anjaneyulu M.V.L.R. (HAG)
Ph.D. (University of Calicut)   Transportation Engineering

Dr. Chandrakaran S. (HAG)
Ph.D. (IISc. Bangalore)   Geotechnical Engineering

Dr. Indira P.V. (HAG)
Ph.D. (University of Calicut)   Structural Engineering

Dr. Madhavan Pillai T.M.
Ph.D. (IIT Madras)   Structural Engineering

Dr. Mohammed Ameen
Ph.D. (IISc. Bangalore)   Computational Structural Mechanics

Dr. Sankar N.
Ph.D. (IIT Madras)   Geotechnical Engineering/ Marine Geotechnical Engineering

Dr. Santosh G. Thampi (HAG)
Ph.D. (IISc Bangalore)　　　　　　　Environmental Hydraulics/ Hydrology

Dr. Shashikala A.P.
Ph.D. (IIT Madras)　　　　　　　　　Structural Engineering, Offshore Structures

Associate Professors
Dr. K. Krishnamurthy
Ph.D. (IIT Madras)　　　　　　　　　Transportation Engineering

Dr. Praveen Nagarajan
Ph.D. (NIT Calicut)　　　　　　　　　Structural Engineering

Mr. Saseendran K.
M.Tech. (University of Roorkee)　　　Geology

Dr. Sasikumar K.
Ph.D. (IISc Bangalore)　　　　　　　Water Resources Engineering

Dr. Sajith A.S.
Ph.D. (NIT Calicut)　　　　　　　　　Structural Engineering

Assistant Professors
Dr. Chitra N.R.
Ph.D. (NIT Calicut)　　　　　　　　　Hydraulics and Water Resources Engineering

Dr. George K. Varghese
Ph.D. (IIT Delhi)　　　　　　　　　　Environmental Engineering

Dr. Harikrishna M.
Ph.D. (IIT Roorkee)　　　　　　　　　Transportation Engineering

Dr. Mini Ramanan
Ph.D. (IIT Madras)　　　　　　　　　Structural Engineering

Dr. Pramada S.K.
Ph.D. (IIT Madras)　　　　　　　　　Water Resources Engineering

Dr. K. Rangaswamy
Ph.D. (IIT Madras)　　　　　　　　　Earthquake Geotechnical Engineering

Ms. Reesha Bharat K.
M.Tech. (VTU Belgam)　　　　　　　Construction Technology

Dr. Sathish Kumar D.
Ph.D. (IIT Roorkee)　　　　　　　　　Remote Sensing and GIS, Hydrology

Mr. M. Sivakumar
M.E. (Anna University)　　　　　　　Urban Engineering

Dr. R. Arun Kumar
Ph.D. (IIT Bombay)　　　　　　　　　Water Resources Engineering

Dr. Renjitha Mary Varghese
Ph.D. (IISc Bangalore)　　　　　　　Geotechnical Engineering

Dr. Aswathy E. V.
Ph.D. (IIT, Madras)　　　　　　　　　Environmental Engineering

Dr. Agilan
Ph.D. (NIT Warangal)　　　　　　　　Water Resources Engineering

Dr. K. V. Anand Ph.D. (IIT Madras)	Coastal Engineering
Dr. Anjana Bhasi Ph.D. (IIT Madras)	Geotechnical Engineering
Dr. Robin Davis P. Ph.D. (IIT Madras)	Structural Engineering

Department of Computer Science and Engineering

Associate Professor & Head

Dr. Saleena N. Ph.D. (NIT Calicut)	Program Analysis, Compilers

Professors

Dr. Priya Chandran Ph.D. (IISc Bangalore)	Computer Architecture, Algorithms & Complexity, Formal Methods for Information Security
Dr. Vineeth K. Paleri Ph.D. (IISc Bangalore)	Compilers and Programming Languages
Dr. S. D. Madhu Kumar Ph.D. (IIT Bombay)	Middleware, Data Base Management Systems, Cloud Computing, Software Engineering
Dr. K. A. Abdul Nazeer Ph.D. (NIT Calicut)	Artificial Intelligence, Bioinformatics, Database Systems, Data Mining

Associate Professors

Dr. Murali Krishnan K Ph.D. (IISc. Bangalore)	Algorithms and Complexity
Dr. Saidalavi Kalady Ph.D. (NIT Calicut)	Computer Architecture, Operating Systems
Dr. P. Vinod Ph.D. (IIT Bombay)	Information Security Management
Dr. R. Subashini Ph.D. (IIT Madras)	Graph Algorithms
Dr. M. Subhasree Ph.D. (IIT Madras)	Computational Geometry
Dr. Jimmy Jose Ph.D. (IIT Kharagpur)	Cryptography and Security

Assistant Professors

Dr. Anu Mary Chacko Ph.D. (NIT Calicut)	Computer Security, Health Informatics
Dr. Gopakumar G. Ph.D. (Kerala University)	Bioinformatics, Data Mining
Dr. Jayaraj P. B. Ph.D. (NIT Calicut)	High Performance Computing, Medical Informatics, Embedded Systems
Dr. Lijiya A. Ph.D. (NIT Calicut)	Artificial Intelligence, Image Processing

Dr. Pournami P. N. Ph.D. (NIT Calicut)	Image Processing
Mr. Sreenu Naik Bhukya M.Tech. (Andhra University)	Computer Networks
Mr. Srinivasa T. M. M.Tech. (VTU)	Image Processing
Dr. Sudeep K.S Ph.D (IIT Bombay)	Algorithms, Graph Theory
Mr. Sumesh T.A M.Tech. (CUSAT)	Computer Networks
Dr. Arun Raj Kumar P. Ph.D. (NIT Trichy)	Computer networks, Internet of Things
Dr. Hiran V. Nath Ph.D. (IRDBT)	Cyber Security and forensics
Dr. Jay Prakash Ph.D. (ABV-IIITM Gwalior)	Data Mining, Soft Computing
Dr. Prabhu M. Ph.D. (Anna University)	Wireless Network Security
Dr. Vasudevan A. R. Ph.D. (NIT Trichy)	Computer Networks, Network Security, System Security
Dr. T. Veni Ph.D. (NIT Trichy)	Cloud Computing, Operating System, High Performance Computing

Department of Electrical Engineering

Professor & Head
Dr. Saly George Ph.D. (NIT Calicut)	Power Electronics

Professors
Dr. Ashok S. (HAG) Ph.D. (IIT Bombay)	Power & Energy Systems
Dr. Abraham T. Mathew Ph.D. (IIT Delhi)	Control Systems
Dr. Jeevamma Jacob Ph.D. (IIT Bombay)	Control Systems
Dr. Paul Joseph K (HAG) Ph.D. (IIT Madras)	Bio-medical Instrumentation
Dr. Sivaji Chakravoti Ph.D. (Jadavpur University)	High Voltage Engineering
Dr. Susy Thomas Ph.D. (IIT Bombay)	Control Systems
Dr. Elizabeth P. Cheriyan Ph.D. (IIT Bombay)	Power Systems

Associate Professors

Mr. Ananthakrishnan P.
M.Tech. (IIT Madras)   Power Electronics & Drives

Mr. Suresh Kumar K.S
M.Tech. (IIT Madras)   Power Electronics

Dr. Preetha P.
Ph.D. (IISc Bangalore)   High Voltage Engineering

Dr. Rijil Ramchand
Ph.D. (IISc Bangalore)   Power Electronics and Drives

Dr. Jagadanand G.
Ph.D. (NIT Calicut)   Signal Processing, Embedded Systems

Dr. Sindhu T.K.
Ph.D. (IIT Madras)   Power Systems & High voltage Engineering

Dr. Mukti Barai
Ph.D. (IIT Kharagpur)   Power Electronics

Dr. Subha D. Puthankattil
Ph.D. (NIT Calicut)   Biomedical Engineering

Dr. Sunitha K.
Ph.D. (IISc Bangalore)   High Voltage Engineering

Dr. Sunitha R.
Ph.D. (NIT Calicut)   Power Systems

Assistant Professors

Ms. Hemarani P.
M.Tech. (IIT Kanpur)   Power Electronics

Dr. Kumaravel S.
Ph.D. (NIT Calicut)   Power & Energy Systems

Dr. Mija S.J.
Ph.D. (NIT Calicut)   Control Systems

Dr. Sunil Kumar T. K.
Ph.D. (IIT Kharagpur)   Power Systems

Mr. Subhash K.M.
M.Tech. (NIT Calicut)   Control and Instrumentation

Dr. M. Sanjay
Ph.D. (SCTIM)   Bio-engineering and Neurosciences

Dr. S. Kanagalakshmi
Ph.D. (Anna University)   Process Control Instrumentation

Dr. V. Karthikeyan
Ph.D. (NIT Allahabad)   Power Electronics and Drives

Dr. Gopakumar Pathirikkat
Ph.D. (NIT Trichy)   Power Systems

Dr. Nikhil Sasidharan
Ph.D. (AIT Bangkok)   Power Electronics and Power Systems

Department of Electronics &Communication Engineering

Professor & Head
Dr. Babu A.V
Ph.D. (NIT Calicut)   Wireless Networks

Professors
Dr. Lillykutty Jacob (HAG)
Ph.D. (IISc Bangalore)   Communication Networks, Wireless Communication

Dr. Sathidevi P.S (HAG)
Ph.D. (University of Calicut)   Speech and Audio Processing, Biomedical Signal processing

Dr. Subramaniam P.C.
Ph.D. (IIT Delhi)   Optical Communication, Nonlinear Dynamics

Dr. Sameer S.M.
Ph.D. (IIT Kharagpur)   Multicarrier Communication Systems, Synchronization and Channel Estimation Issues, Next generation wireless Networks, Statistical signal processing

Dr. Ali C.K.
Ph.D. (University of Calicut)   Digital Communication Systems

Dr. Deepthi P.P.
Ph.D. (NIT Calicut)   Communication Engineering, Cryptography

Associate Professors
Dr. Abhilash G.
Ph.D. (IISc. Bangalore)   Compressed Sensing and Sparse Signal Processing, Graph Signal Processing, Machine Learning

Mr. Jaikumar M.G.
Ph.D. (Ongoing IIT Madras)   Micro Electronics & VLSI Design

Ms. Lyla B. Das
M.Sc. (Engg.) (University of Calicut)   Embedded systems

Dr. Sreelekha G.
Ph.D. (NIT Calicut)   Image and Video Processing

Mr. Suresh R.
M.Tech. (CUSAT)   Signal Processing and Communication

Assistant Professors
Dr. Ameer P. M.
Ph.D. (NIT Calicut)   Telecommunication

Mr. Bhuvan B.
Ph.D.(Ongoing IIT Delhi)   Electronic Design & Technology, VLSI Design

Dr. Bindiya T.S.
Ph.D. (NIT Calicut)   VLSI Design, Multirate Signal Processing

Dr.Dhanaraj K.J.
Ph.D. (IIT Delhi)   VLSI Design, Analog IC Design

Dr. Jayakumar E. P.
Ph.D. (NIT Calicut)   VLSI Design, Digital Signal Processing

Dr. Praveen Sankaran
Ph.D.(Old Dominion University, VA USA)   Statistical Pattern Analysis, Image Processing, Biometrics

Mr. Raghu C.V. M.Tech.(IISc Bangalore)	Electronic Design & Technology
Dr. Sakthivel V Ph.D. (NITCalicut)	Advanced Communication Systems, Digital Signal Processing
Dr. Sudhish N George Ph.D. (NIT Calicut)	Sparse Signal Processing, Multimedia Encryption
Dr. Suja K. J. Ph.D. (NIT Calicut)	Optoelectronics, MEMS
Dr. Venu Anand Ph.D. (IISc Bangalore)	Microelectronics Process Technology
Dr. Lintu Rajan Ph.D. (NIT Jaipur)	Semiconductor Device Fabrication and Modeling, Nanotechnology, Gas Sensor, Schottky Diode based Devices, MEMS
Dr. Gopikrishna Saramekala Ph.D. (NIT Rourkela)	Modeling, Simulation and Fabrication of Semiconductor Devices
Dr. Sudeep P V Ph.D.(NIT Trichy)	Medial Image Analysis
Dr. Surya Prakash Matcha Ph.D. (IIT Guwahati)	Signal Processing, Digital VLSI
Dr. Waquar Ahmad Ph.D. (IIT Kanpur)	Speaker Recognition/Verification, Children Speech Recognition under Mismatch Conditions, Speech Signal Processing.

Department of Mathematics
Associate Professor & Head

Dr. Satyananda Panda Ph.D. (Technical University of Kaiserslautern, Germany)	Computational fluid Dynamics & Scientific Computing.

Professors

Dr. Jacob M.J. Ph.D. (CUSAT)	Stochastic Processes
Dr. Jessy John C. Ph.D. (CUSAT)	Time Series Analysis/ Statistical Methods for Quality Management
Dr. M. S. Sunitha M.Phil. (CUSAT) Ph.D. (CUSAT)	Fuzzy Graph Theory

Associate Professors

Dr. Chithra A.V. Ph. D. (CUSAT)	Operator Theory, Functional Analysis, Graph Theory
Dr. Sushama C.M. Ph.D. (NIT Calicut)	Operations Research

Assistant Professors

Dr. Ashish Awasthi Ph.D. (IIT Kanpur)	Numerical Analysis, Numerical and Analytical methods for Singularly Perturbed Differential Equations.
Dr. Krishnan Paramasivam Ph.D. (IIT Madras)	Algebraic Graph Theory, Algorithms and Complexity

Dr. Lineesh M.C. Ph.D. (NIT Calicut)	Time series Analysis, Wavelet Theory.
Dr. Mahesh Kumar Ph.D. (IIT Bombay)	Applied Statistics, Reliability of Systems
Dr. Sanjay P.K. Ph.D. (IISc Bangalore)	Harmonic Analysis
Dr. Sunil Mathew Ph.D. (NIT Calicut)	Fuzzy Graph Theory, Bio Computational modelling, Fractal Geometry
Dr. Suresh Kumar Nadupuri Ph.D (Otto von Guericke University of Magdeburg - Germany)	Numerical Methods and Scientific Computing

Department of Mechanical Engineering

Professor (HAG) & Head

Dr. Jose Mathew Ph.D. (IIT Bombay)	Manufacturing Science

Professors

Dr. R. Sridharan (HAG) Ph.D.(IIT Bombay)	Industrial Engineering
Dr. Ghulam Jilani Ph.D. (IIT Kanpur)	Computational Fluid Dynamics & Heat Transfer
Dr. S. Jayaraj (HAG) Ph.D. (IIT Kanpur)	Thermal Sciences, Energy Engineering & CFD
Dr. Rajendrakumar P.K. Ph.D. (IISc Bangalore)	Machine Design and Tribology
Dr. Joseph M.A. Ph.D. (University of Calicut)	Production Engineering
Dr. Joy M.L Ph.D. (University of Calicut)	Machine Design and Tribology
Dr. C. Muraleedharan (HAG) Ph.D. (University of Calicut)	Refrigeration & Air Conditioning
Dr. Sobhan C.B. (HAG) Adjunct Faculty Ph.D. (IIT Madras)	Heat Transfer
Dr. Shaija A. Ph.D. (IISc Bangalore)	Computational Fluid Dynamics & Heat Transfer
Dr. Madhusudanan Pillai V. Ph.D. (University of Calicut)	Industrial Engineering
Dr. Biju T. Kuzhiveli Ph.D. (IIT Bombay)	Cryogenics

Associate Professors

Dr. Manu R. Ph.D. (IIT Madras)	Manufacturing Engineering

Dr. Narayanan M. D. Ph.D. (IIT Madras)	Non-linear Dynamics
Dr. Arun P. Ph.D. (IIT Bombay)	Energy Systems
Dr. P.B. Dhanish Ph.D. (NIT Calicut)	Production Engineering
Dr. Sajith V. (Adjunct faculty) Ph.D. (NIT Calicut)	Optical Measurement & Heat Transfer

Assistant Professors

Dr. Gangadhara Kiran Kumar L Ph.D. (IIT Guwahati)	Fluids and Thermal Sciences
Dr. Hanas T (Adjunct Faculty) Ph.D.(IIT Madras)	Medical Materials, Affordable Health Care, Nanomaterials
Dr. Jagadeesha T Ph.D. (JNTU Hyderbad)	Manufacturing engineering
Dr. Jayadeep U.B. Ph.D. (IISc Bangalore)	Solid Mechanics
Mr. Manu P.V. M.Tech. (Kerala University)	Propulsion Engineering
Dr. Ratna Kumar. K Ph.D. (NIT Calicut)	Industrial Engineering and Management
Dr. Rohini Kumar B. Ph.D. (NIT Calicut)	Thermal Science
Dr. T.J. Sarvoththama Jothi Ph.D. (IIT Madras)	Gas Dynamics, Aero-acoustics
Dr. Sekar K. Ph.D. (NIT, Calicut)	Manufacturing Engineering
Dr. Shijo Thomas (Adjunct Faculty) Ph.D. (NIT Calicut)	Thermal Engineering
Mr. Sreenath A.M. M.Tech. (IIT Madras)	Machine Design
Dr. Srinivas M. PhD. (NIT, Calicut)	Non-conventional Energy Systems
Dr. Sudheer A.P. Ph.D. (NIT, Calicut)	Manufacturing Engineering
Dr. Varaprasad G. Ph.D. (NIT Calicut)	Marketing Management & Consumer Behaviour
Dr. Vinay V. Panicker Ph.D. (NIT Calicut)	Industrial Engineering and Management
Dr. Ashesh Saha Ph.D. (IIT Kanpur)	Machine Design
Dr. Deepak Lawrence K. Ph.D. (IIT Madras)	Metrology and Computer Aided Inspection, Tribology

Dr. Gangolu Srinu Ph.D. (IIT Bombay)	Material Science
Dr. Murali K. P. Ph.D. (IIT Bombay)	Material Science
Dr. Saleel Ismail Ph.D. (IIT Madras)	Thermal Engineering
Dr. Simon Peter Ph.D. (IIT Guwahati)	Thermal Engineering
Dr. Sujith Kumar C. S. Ph.D. (NIT Trichy)	Thermal Engineering
Dr. Vineesh K. P. Ph.D. (IIT Kharagpur)	Machine Design

School of Materials Science and Engineering

Professor & Head

Dr. N. Sandhyarani Ph.D. (IIT Madras)	Bio sensors, Nano materials for Electrochemical energy Generation and Storage, Photo/Electrocatalytic Water Splitting.

Professor (HAG)

Dr. C.B. Sobhan Ph.D. (IIT Madras)	Microscale and Nanoscale Heat Transfer, Thermal Phenomena in nanofluids, Optical Measurements.

Associate Professors

Dr. V. Sajith Ph.D. (NIT Calicut)	Nanofluids, Optical Measurements, Corrosion and Wear Resistant Coatings, Electronics Cooling.
Dr. Soney Varghese Ph.D. (Eindhoven University of Technology, Netherlands)	Microscopy for Nanotechnology, Nanofabrication Polymer technology, Liquid Crystal Display Ferroelectric devices,

Assistant Professors

Dr. T. Hanas Ph.D. (IIT Madras)	Medical Materials, Surface Modifications and Coating Techniques, NanoComposites, Electrospinning, Serve Plastic Deformation, Biodegradable Metallic Implants, Affordable Healthcare.
Dr. Shijo Thomas Ph.D. (NIT Calicut)	Heat Transfer, Nanofluids, Waste to fuel, CO_2 adsorption, Solar desalination, Solar Thermal Recovery and Storage.

Department of Physics

Professor (HAG) & Head

Dr. P. Predeep Ph.D. (University of Rajasthan)	Organic and Molecular Electronics & Photonics (Organic Solar Cells, OLED, OFETs, Organic Semi-Conductors)

Professors

Dr. Chandrasekharan.K. Ph.D. (IIT Madras)	Solid State Physics, Non-linear Optics
Dr. M.K.Ravi Varma Ph.D. (Nevada, USA)	Spectroscopy, Applied Optics, Atmospheric Sciences

Associate Professors

Dr. Raghu Chatanathodi Ph.D. (IISc Bangalore)	Condensed Matter Physics (Theory)

Dr. Aji A. Anappara Ph.D. (Scuola Normale Superiore, Italy)	Semiconductor Photonics

Assistant Professors

Dr. Madhavan Unni Ph.D. (IISc Bangalore)	Critical Point Phenomenon & Nonlinear dynamics
Dr. Vari Sivaji Reddy Ph.D. (IIT Kharagpur)	Organic Electronics & Photovoltaics
Dr. Suchand Sangeeth C S Ph.D. (IISc Bangalore)	Charge transport, molecular electronics, organic semiconductors, molecular self-assembly and meta-materials
Dr. Ram Ajor Maurya Ph.D. (Physical Research Laboratory, Ahmedabad)	Solar Astrophysics: Helioseismology, MHD waves in Solar Atmosphere, Solar Eruptions and associated Phenomenon
Dr. Aswathi G Ph.D. (IISER Thiruvananthapuram)	Multifunctional nanostructured materials and energy storage/environmental applications, Lithium ion batteries, Supercapacitors, Hybrid energy devices
Dr. Subramanyan Namboodiri Ph.D. (Technical university of Darmstadt, Germany)	Optofluidics, Interface physics
Dr. Maneesh Chandran Ph.D. (IIT Madras)	Surface Science, Materials Science; Nanotechnology; Semiconductors; Tribology
Dr. Goutam Kumar Chandra Ph.D. (IIT Kharagpur)	Experimental Condensed Matter Physics, Spectroscopy.
Dr. Saurabh Gupta Ph.D. (BHU)	Theoretical High Energy Physics and Particle Physics

Department of Physical Education

Assistant Professor & HOD

Mr. Sunil M.S. Ph.D. Ongoing(Tamil Nadu Physical Education and Sports University Chennai) M.Phil. (Alagappa University) M.P.Ed.(Bharathiar University)	Sports Physiology, Critical Analysis in Soccer, Analysis of Computer Software Program in Soccer, Training methods, Fitness Principles and Yoga

Centre for Biomechanics

Head

Dr. Madhavan Pillai T.M.(Adjunct Faculty) Ph.D. (IIT Madras)	Structural Engineering, Biomechanics

Faculty

Dr. Abhilash G. (Adjunct Faculty) Ph.D. (IISc. Bangalore)	Signal Theory (Bio signal processing)
Dr. Mohammed Ameen (Adjunct Faculty) Ph.D. (IISc. Bangalore)	Computational Solid Mechanics, Biomechanics

Dr. Rajendrakumar P.K.(Adjunct
Faculty)Ph.D. (IISc. Bangalore)

Centre for Training and Placement

Professor & Head

Dr. Sameer S.M.
Ph.D. (IIT Kharagpur)

Coordinator (Placement)
Dr. P. Vinod
Ph.D. (IIT Bombay)

Coordinator (Training)
Dr. Hanas T.
Ph.D. (IIT Madras)

Centre for Continuing Education

Coordinator
Dr. Indira P.V.
Ph.D. (University of Calicut)

School of Management Studies

Associate Professor & Head
Dr.T. Radha Ramanan Ph.D.
(NIT.Trichy)   Cost Management, Financial Management, Manufacturing

Professors
Dr. T. K. Suresh Babu
Ph.D. (IIT Delhi)   Industrial Engineering & Management Science

Assistant Professors

Dr. K. Muhammad Shafi
Ph.D. (Aligarh Muslim University)   Financial Management, Investment Management

Dr. Preethi Navaneet
Ph.D. (University of Rajasthan)   Communication

Dr. Sunitha S
Ph.D. (IIT Madras)   Economics and Public Finance

Dr. Althaf S.
Ph.D. (IIM Bangalore)   Economics and Public Policy

Dr. Sreejith S. S.
Ph.D. (IISc. Bangalore)   HR Operations and Analytics

Dr. Reju George Mathew
Ph.D. (EFLU Hyderabad)   Communication and Literature

Dr. Nithya M.
Ph.D. (Anna University.)   Marketing Management and Marketing Research

1.6   STUDENT AFFAIRS COUNCIL (SAC) AND CO-CURRICULAR ACTIVITIES

The Students Affairs Council, also referred to as SAC, is a student representative body whose members are elected by the student community. It is the apex student body of NITC and is responsible for a wide range of activities and events that take place in the campus. The most prominent role of the Students' Council, however, is its endeavor to ensure the academic progress of the students and their well-being.

The executive council functions as a body accountable to the SAC to execute and implement the policies of SAC. Presided over by the General Secretary, it also addresses the grievances of the student community and works for their welfare. It also comprises of Academics Affairs Secretary, Research Affairs Secretary, Hostel Affairs Secretary, Sports Secretary, Cultural Affairs Secretary, Technical Affairs Secretary, Joint Secretary and Chief Student Editor. Each executive chairs a council which tackles the issues under his/ her domain.

The SAC organizes various cultural and technical events through different clubs and forums and also the two major annual events: "Tathva", the techno- management festival, held in the Monsoon semester and the cultural festival "Ragam", held in the Winter semester.

1.7   TRAINING AND PLACEMENT

The Institute has a Centre for Training & Placement which looks after the training / internship for the students, their placement on graduation and for partnership with industry.

1.8   TECHNOLOGY BUSINESS INCUBATOR

A Technology Business Incubator (TBI) with the assistance from Department of Science and Technology, Government of India has been established. TBI helps in incubating knowledge based start-ups into sustainable business providing necessary infrastructure and guidance.

1.9   PARENT TEACHER ASSOCIATION

CREC Parent –Teacher Association had originated as a charitable society keeping the objective of developing the educational, cultural, and training activities of students who are admitted in CREC (presently NIT Calicut) on no profit no loss basis. At present, Dr. P.S. Sathidevi, Dean (Academic), Dr. A. Shaija,Professor, MED and Dr. Sudhish N George, Asst. Professor, ECED are nominated as the President, Secretary, Joint Secretary cum Treasurer, respectively. Some of the major activities of the PTA include the following:-

  ☐ Financial assistance to meritorious students requiring financial support
  ☐ Silver Jubilee Endowment Trust Scholarship for needy students
  ☐ Cash awards for gold medalists from all branches of study
  ☐ Travel support for Students for presenting papers in International Conferences held in India
  ☐ Organizing department level Parent Teachers Meetings and Annual GBM during every year
  ☐ Supporting cultural & technical festivals organized by Students & Staff of NIT Calicut.
  ☐ Financial support to the student volunteers in Central Library.

More details of CREC PTA can be found in the website: http://www.nitc.ac.in/crecpta.
Email id: crecpta@gmail.com. Phone number: 04952286126

1.10 WORKING HOURS

Class Timings: Monday through Friday, 8.00 am to 12.15 pm and 1 pm to 6 pm.

Academic Departments & Office: Monday through Friday, 9.00 am to 5.30 pm with half an hour break for lunch

Library: Monday through Saturday, 8.00 am to 11.00 pm (except Public Holidays)

Central Computer Centre: 7 am to 12 midnight (except Public Holidays)

Health Centre: Monday through Saturday, 9.00 am to 5.30 pm; Sundays and Public Holidays - 10.00 am to 12.00 noon

2. UNDERGRADUATE ADMISSIONS

2.1 ADMISSION CATEGORIES

Admission to B.Arch. / B.Tech. Degree programmes offered at NIT Calicut is made under the following categories:

Sl. No.	Category	Basis of Admission	Number of Seats
1	Candidates from Kerala State[@]	JEE (Main)* Rank	556
2	Candidates from Other States[@]	JEE (Main)* Rank	556
3	Foreign Nationals[$]	Marks in the Qualifying Examination	16
4	MEA Welfare Scheme #	Marks in the Qualifying Examination	02
5	Direct Admission of Students Abroad (DASA) scheme	SAT Score	97
6	Children of Indian workers in Gulf Countries (CIWG) scheme	SAT Score	48
7	Supernumerary Seats for Lakshadweep and Kandvi	JEE (Main)* Rank	33

@ - Reservations as per Rules of GoI.

* - Joint Entrance Examination (Main), conducted by the National Testing Agency (NTA), New Delhi.

$ - Nominated by Ministry of External Affairs (Students Cell).

- Nominated by Ministry of External Affairs

2.2 ADMISSION THROUGH JEE (MAIN)

Academic Requirements

For admission to the B.Tech. programmes of NIT Calicut through JEE, the candidate should have secured a rank in JEE (Main) 2019 Paper-1and satisfy at least one of the two criteria given below:

(i) The candidate is within the category-wise top 20 percentile of successful candidates in their respective Class XII (or equivalent) examination of respective stream and Board with Physics and Mathematics as compulsory subjects along with one of the Chemistry/Biotechnology/Biology/Technical vocational subject, a language and any subject other than the above four.

(ii) The candidate has secured minimum 75% (for GEN or OBC-NCL) or minimum 65 % (for SC, ST or PwD) of aggregate marks in the Class XII (or equivalent) examination of respective stream and Board with Physics and Mathematics as compulsory subjects along with one of the Chemistry/ Biotechnology/ Biology/ Technical vocational subject, a language and any subject other than the above four.

For admission to B. Arch. programme of NIT Calicut through JEE, the candidate should have secured a rank in JEE (Main) 2019 Paper- 2 and satisfy at least one of the two criteria given below:

(i) The candidate is within the category-wise top 20 percentile of successful candidates in their respective Class XII (or equivalent) examination of respective stream and Board with Mathematics, Physics and Chemistry (as compulsory subjects), and other two subjects.

(ii) The candidate has secured minimum 75% (for GEN or OBC-NCL) or minimum 65 % (for SC, ST or PwD) of aggregate marks in the Class XII (or equivalent) examination of respective stream and Board with Mathematics, Physics and Chemistry (as compulsory subjects), and other two subjects.

Admission to Kerala State Quota (HS) and Other State (OS) Quota of Seats

Admission is purely on the basis of the rank obtained in JEE (Main) conducted by National Testing Agency (NTA) and subject to other **eligibility conditions** and availability of seats. The application for JEE (Main) submitted to NTA/CSAB will alone be considered for admission. No separate application is required for admission to Kerala state quota and Other State quota of seats in NIT Calicut.

Distribution of Seats through Central Admission Process of Joint Seat Allocation Authority (JoSAA)

The seat matrix for 2019-'20 admission to NIT Calicut through Central Counselling of JoSAA 2019 is as follows:

Sl.No	Branch/ Code	OP	OBC	SC	ST	EWS	Total
1	Architecture (AR)	22	14	9	5	3	53
2	Biotechnology (BT)	15	9	6	2	2	34
3	Chemical Engineering (CH)	47	28	16	8	6	105
4	Civil Engineering (CE)	70	42	23	11	8	154
5	Computer Science & Engineering (CS)	71	43	23	11	9	155+2*
6	Electronics & Communication Engineering (EC)	70	42	23	12	8	155
7	Electrical & Electronics Engineering (EE)	70	43	22	11	9	155
8	Engineering Physics (EP)	15	9	6	3	1	34
9	Mechanical Engineering (ME)	82	48	27	14	11	159+23*
10	Production Engineering (PE)	23	14	8	5	3	53
11	Materials Science & Engineering (MT)	12	8	5	2	3	30
	Total	**497**	**300**	**168**	**84**	**63**	**1112**

* Supernumerary seats for female as per MHRD Order No. F.NO.35-8/2017-TS.III

NIT Calicut provides 5% seats reservation for PC/PD/PwD category as per Govt. of India rules.

Admission

Joint Seat Allocation Authority (JoSAA) 2019 constituted by Ministry of Human Resource Development (MHRD), Government of India, as per the No. F .35-12/2013-TS.III, comprising of Central Seat Allocation Board (CSAB) 2019 and Joint Admission Board (JAB) 2019 will conduct and supervise the admission process of candidates to various NITs. CSAB has identified reporting centres throughout the country to complete the exercise and **NIT Calicut is one of the designated Reporting Centres of CSAB 2019.** The admission process to various NITs has been broadly divided in to three phases, namely;

(i)Phase-I: Off-campus online Registration, Choice Filling and Locking.

(ii) Phase-II: Remote reporting to JoSAA/CSAB - by reporting at any of the designated Reporting Centres of CSAB 2019.

(iii) Phase-III: Physical reporting at the allotted institute for admission.

The category of institutions which fill up the seats in Engineering/Architecture through CSAB based on JEE (Main) rank includes all NITs, Indian Institutes of Information Technology, (IIITs), and other technical institutes funded fully or partially by central or state governments (other- GFTIs)

Counselling/Admission

Admission will be on the basis of JEE (Main) rank subject to eligibility and availability of seats. The registration and online choice filling starts on 16/06/2019 and continues till 25/06/2019. There will be seven rounds of allotment this year. After each round of allotment the candidates are given time to accept the allotment by paying the seat acceptance fee and reporting at any of the designated CSAB reporting centres. While reporting to accept the seat, the candidates will have to produce the certificates in original and the proof of remitting the seat acceptance fee, at the reporting centre. The seat acceptance fee is Rs. 15000/ for SC, ST and PwD categories. For all others, it is Rs. 35000/- . Physical reporting at the admitted institute is after all the seven rounds of allotments. More information and updates can be had from the JoSAA website, https://josaa.nic.in. In addition to the regular rounds of JoSAA, CSAB will conduct two special rounds of counseling for filling the vacant seats. More information on this will be available at the CSAB website: https://csab.nic.in

2.3 ADMISSION UNDER DASA SCHEME

DASA Scheme is applicable for Foreign Nationals studying in any country (including India) or persons of Indian origin staying abroad or Indian Nationals studying abroad. The Indian Nationals must have had at least two years of education inclusive of 10+2 (not beyond) in a Foreign Country during the last six years and must pass the qualifying examination from abroad.

CIWG Scheme : As per AICTE notification New Delhi of 21st January, 2004 issued vide Gazette notification No: F-37-3/ legal /2004 dated: 21st January, 2004, published to indicate the provisions of All India Council for Technical Education (admission under supernumerary quota for foreign nationals (FN)/Persons of Indian Origin (PIOs) / Children of Indian Workers in the Gulf Countries (CIWG), in AICTE approved Institutions) regulations, 2004 under which 15% seats in all the Institutions/University Departments, approved by AICTE, offering technical courses leading to Diploma, Degree and post graduate degree in Engineering and Technology, Architecture and Town Planning, and MBA shall be allowed on supernumerary basis from amongst foreign nationals (Foreign Nationals (FN) / Persons of Indian Origin (PIOs)/Children of Indian Workers in the Gulf Countries (CIWG), over and above the approved intake, provided that $1/3^{rd}$ of the 15% shall be reserved across different disciplines in the educational institutions for the children of Indian workers in the gulf countries.

There shall be one third reservation for Children of Indian Workers in Gulf Countries (CIWG). However, any vacant seats out of 1/3 category of CIWG shall be reverted to the quota of 2/3 meant for other categories of DASA-2018. Eligibility of CIWG will be same as that of NRIs. However, CIWG will have to pay fee at par with resident citizens. There has to be proof of either parent working in a gulf country / Copy of Parent's visa / Copy of parent's Working Permit (if any) / Certificate from the company/organization as proof that parent is working in gulf country. Fee as that of resident student will be applicable. Any change in tuition fee from competent authority from time to time will be applicable to CIWG also. Countries under CIWG are Bahrain, Iraq, Iran, Kuwait, Oman, Qatar, Saudi Arabia, and United Arab Emirates

Distribution of seats

Sl.No.	Programme	CIWG	DASA	Total
1	Architecture	2	5	7
2	Biotechnology	1	3	4
3	Chemical Engineering	5	9	14
4	Civil Engineering	7	14	21
5	Computer Science and Engineering	7	14	21
6	Electrical and Electronics Engineering	7	14	21
7	Electronics and Communication Engineering	7	14	21
8	Engineering Physics	1	3	4
9	Materials Science & Engineering	1	3	4
10	Mechanical Engineering	7	14	21
11	Production Engineering	3	4	7
	Total	**48**	**97**	**145**

NIT K Surathkal is the coordinating agency for admission under the DASA & CIWG scheme for the year 2019-'20. Details can be obtained from Coordinator, DASA 2019 (E.mail: dasa2019@nitk.edu.in Website: https://www.dasanit.org)

2.4 ADMISSION UNDER MEA WELFARE SCHEME
The two seats under this scheme are filled through nomination by the Ministry of External Affairs.

2.5 ADMISSION OF FOREIGN NATIONALS UNDER ICCR SCHOLARSHIP
Candidates are nominated to these seats by the Ministry of External Affairs (Students Cell), Govt. of India. For details, please contact: SO (Education), Ministry of External affairs, Students Cell, Room No. 1007, Akbar Bhawan, Chanakyapuri, New Delhi - 110021 (Tel:091-11-26876133 & 24121219 & Telefax: 26876134), through Indian Council for Cultural Relations (ICCR). The candidates have to satisfy the general admission requirements for NIT Calicut specified earlier.

Distribution of Seats

	Arch.	BT	CH	CE	CS	EE	EC	ME	PE	Total
B.Tech. / B.Arch.	2	1	1	3	1	3	1	3	1	16

2.7 INSTITUTE FEE STRUCTURE

Tuition Fee may vary as per the directives of Ministry of HRD, Government of India from time to time. The present tuition fee is as per MHRD Order F No. 33-4/2014-TS.III dated 24th June, 2016, except for foreign nationals, DASA, CIWG, etc. Other fees are as determined by the Institute as per provision of Statute No. 37(i) (b).

Fee Category	GEN/OBC/EWS Candidates having annual family income greater than 5 lakhs (Rs.)	GEN/OBC/EWS Candidates having annual family income between 1 lakh and upto and including 5 lakhs (Rs.)	GEN/OBC/EWS candidates having annual family income less than 1 lakh (Rs.)	All SC & ST candidates** (Rs.)	All PwD candidates** (Rs.)	Foreign Nationals & Candidates under DASA scheme (Rs.)	Candidates under CIWG scheme (Rs.)
Tuition Fee per annum (to be paid semester-wise)*	1,25,000	41,667	NIL	NIL	NIL	US$8000 (US$4000 for SAARC)	1,25,000
Caution Deposit	1500	1500	1500	1500	1500	3000	3000
Examination Fee	1050	1050	1050	1050	1050	1050	1050
Other Fees:							
Admission Fee	300	300	300	300	300	300	300
Library Fee	1500	1500	1500	1500	1500	1500	1500
Development Fee	2250	2250	2250	2250	2250	2250	2250
Students Group	900	900	900	900	900	900	900
Other Fee	300	300	300	300	300	300	300
Matriculation & Recognition	150	150	150	150	150	150	150
Sports Affiliation	450	450	450	450	450	450	450
Students Welfare	450	450	450	450	450	450	450
Amenities Fee	450	450	450	450	450	450	450
Magazine Fee	150	150	150	150	150	150	150
Association Fee	1150	1150	1150	1150	1150	1150	1150
Registration Fee	600	600	600	600	600	600	600
Annual Premium for Mediclaim@	930	930	930	930	930	930	930
Total	**1,37,130/-***	**53,797/-***	**12,130/-***	**12,130/-***	**12,130/-***	**US$8000+ Rs.13,630/-***	**Rs.1,25,000+ Rs.13,630/-***

@ Medi-claim coverage will be available only after obtaining the policy in the name of the student which may take 4-5 months.* Students admitted to B.Arch. programme have to pay an additional amount of Rs.50/- for NASA annual subscription fee.**Fee paid by the SC/ST/PwD students at the time of JoSAA seat acceptance will be refunded on receipt of the same from JoSAA.# The financial requirements given above are subject to change.

The fee paid to JoSAA/DASA will be adjusted with the Institute Fee. Fees for candidates under MEA category is same as that of JEE (Main) candidates

2.8 SCHOLARSHIPS AND AWARDS

Various Scholarships / Financial Aid offered by Central/State Governments and other agencies are available to the students of all UG and PG programmes of NITC. The students and parents have to keep a watch on this and has to apply online/ offline as directed therein. Institute will not be responsible for notifying these scholarships/ financial aids. There are some scholarships offered through National Scholarship Portal. Students and parents have to regularly watch on this web site and submit their applications. For online verifications by the Institute, the students have to submit the documents to the Academic Section well within the time frame announced.

Kerala Students - SC/ST Development Department of Government of Kerala offers educational concession to SC/ST/OBC/OEC/SEBC/FC students through e-grantz (online) as per the eligibility norms prescribed by them to the Kerala students. The students have to apply online through Akshaya for this concession immediately on joining the institute and have to submit documents at Academic Section of the Institute for onward transmission for sanction.

Students from other States - Students from other States have to enquire and keep a watch on the various scholarships offered by their State Government/ Agencies. If eligible they have to apply online/ offline as notified by them.

The Ministry of Human Resources Development, Department of Higher Education, Government of India offers a scholarship titled "Central Sector Scheme of Scholarship for Top Class Education for SC/ST Students", The details are available in the National Scholarship Portal.

Students belonging to notified minority communities, studying in India can apply for the scholarships offered by the Ministry of Minority Affairs, Govt. of India. Details of this scholarship can be obtained from the following website: www.momascholarship.gov.in

The students eligible for Merit cum Means Scholarship have to keep a watch on the notifications on the web and have to apply online within the time prescribed frame. The documents have to be submitted to the Academic Section for online verification by the Institute.

Subramonia Iyer- Lekshmi Ammal (SILA) Scholarship: Our distinguished alumnus of CREC 1967-1972 B.Tech. Civil Engineering programme, Shri.Sivaramakrishnan S.Iyer, has instituted a scholarship, named as SILA Scholarship, for students of the Department of Civil Engineering, NIT Calicut. The scholarship, designated as the Subramonia Iyer-Lekshmi Ammal (SILA) Scholarship, is named after his parents. The Scholarship would commence from the academic year 2020-2021 onwards. The Scholarship amount, along with the citation, would be disbursed to the student with the highest score, based on his/her performance in the first, second and third year of study. Six students would benefit from the scholarship, with the student having the highest score being awarded an amount of Rs.50,000/-(Rupees Fifty thousand only) and the student with the second highest score being awarded an amount of Rs.20,000/-(Rupees Twenty thousand only),in an academic year.

Silver Jubilee Endowment Trust Scholarships

CREC Silver Jubilee Endowment Trust (SJET) of the Institute, a registered body with the Director as Chairman and other ex-officio and nominated members as Trustees. During the academic year 2018-19 SJET awards 98 scholarships worth Rs.10,000/- each per annum(Total amount of scholarships awarded last year=Rs.9.8 Lakhs). The number and the value of the scholarship for a year will vary depending on the availability of funds and the sponsors. The SJET will invite applications from the students and based on the recommendations of HOD and a subcommittee, the scholarships are awarded to the deserving students. The academic merit, economic backwardness and other performance parameters of the students are considered for this. The SJET scholarships include:

1. Prof. A.O. Kunjipaulo Endowment Scholarship

2. Class of 1992 Computer Engineering Alumni Scholarship

3. RECCAA, Singapore Scholarship

4. RECCAA, USA Scholarship

5. RECCAA, Bahrain Scholarship

6. REC 1st Batch Scholarship

7. RECCAA, Mumbai Scholarships (2 nos.)

8. CSAI (Class of 2000) Scholarships (4 nos.)

9. REC 76-81 Batch Scholarships (2 nos.)

10. 10 years of XXXIInd Batch (CREC 96) Scholarship

11. REC Calicut 1982 Batch Scholarship

12. NITC (REC) 1983 Batch Scholarship

13. REC Calicut, Class of 84 Trust Scholarship

14. CREC 80-85 Batch Scholarship

15. Padmanabhan Scholarship in Memory of All Departed Souls of 77 Batch, CREC

16. Capt. Mohammed Memorial Endowment Scholarship

17. Nitin Sharma Memorial Scholarship (CE)

18. 1997-2001 CSE B.Tech..Batch Scholarship (CSE)

19. Mariveetil Raghunath Memorial Endowment Scholarship
20. Joseephus MT, John Sebastian &Luthufi KT Memorial Scholarship, 2004-08 Batch.
21. 1984-88 Batch of CREC/NIT scholarship
22. Sainadhan Memorial Endowment Scholarship (NSS)
23. 1986-90 Batch of CREC/NITC Scholarships (3 Nos.)

In addition to the above, the Parent Teacher Association (**PTA**) awards (through SJET) scholarships worth Rs.1.05 lakh

AWARDS

Bapna Gold Medal: Er.Bapna Award is a Gold Medal awarded to the students who have scored highest CGPA among all undergraduate courses and also for highest CGPA among all Postgraduate courses of NIT Calicut. The Award consists of Gold Medal, a certificate and a cash prize of Rs.11,111/- This Gold medal is given during the institute convocation. This award is being given to the students right from the 1st convocation of NIT Calicut.

Prof. Allesu Kanjirathinkal Memorial Award: From the year 2019 onwards, the best graduating B.Tech student of the institute would be presented with the *'Prof. Allesu Kanjirathinkal Memorial Award'* instituted in memory of Dr. Allesu K (former Professor in the Department of Mechanical Engineering, NITC), by his family. The awardee would receive Rs.10,000/-, a certificate and a gold medal, during the Annual Convocation Ceremony of the institute.

Other Scholarships and Financial Aids

The Institute Hostels provide financial assistance to twelve students per year @ Rs. 500/- per month. In addition, National Loan Scholarship of Govt. of India, Merit Scholarship for children of school teachers, financial aid offered from the Poor Student Aid Fund of the Institute and the like, are offered to deserving candidates.

The Institute also provides opportunities to students to *'earn while they learn'* through part time work in the Institute Library, Hostels etc. which is funded by PTA.

CURRICULUM AND SYLLABI

(I and II Semesters)

(Applicable to 2017 Admission onwards)

3.1 CURRICULUM B.ARCH.

Semester I

S. No	Code	Subject	L	T	P/D	C	Category
			Hours/Week				
1	MA1003D	Mathematics for Architecture	3	1	0	3	MA
2	MS1001D	Professional Communication	3	0	0	3	HL
3	AP1001D	Architectural Graphics I	2	0	3	3	AR
4	AP1002D	History of Architecture I	3	0	0	3	AR
5	AP1003D	Introduction to Architectural Design I	0	0	6	4	AR
6	AP1091D	Fine Arts I	0	0	3	2	AR
7	ZZ1096D	Workshop	0	0	3	2	BE
8	OT	Physical Education, Value Education and NSS				3*	OT
		TOTAL	**11**	**1**	**15**	**20+3**	

*: Three courses of **One Credit each** to be credited before completing six semesters of the program.

Semester II

S. No	Code	Subject	L	T	P/D	C	Category
			Hours/Week				
1	BT1001D	Introduction to Life Science	2	0	0	2	BS
2	AP1004D	Architectural Graphics II	2	0	3	3	AR
3	AP1005D	Applied Mechanics	3	1	0	3	AR
4	AP1006D	History of Architecture II	3	0	0	3	AR
5	AP1007D	Theory of Design	3	0	0	3	AR
6	AP1008D	Introduction to Architectural Design II	0	0	6	4	AR
7	AP1093D	Fine Arts II	0	0	3	2	AR
		TOTAL	**13**	**1**	**12**	**20**	

MA1003D - MATHEMATICS FOR ARCHITECTURE

Pre-requisites: Nil

L	T	P/D	C
3	1	0	3

Total hours: 39

Course Outcomes:

CO1: To formulate different menstruation problems as multiple integrals and evaluate them

CO2: To find the parametric representation of curves and surfaces in space and will be able to evaluate integral of functions over curves and surfaces

CO3: To test for the convergence of sequences and series of numbers as well as functions

CO4: To use vector differential calculus to solve problems related to curvature and surface normal

CO5: To find solutions for right angled spherical triangles

CO6: To draw and analyze different plane curves in Cartesian and Polar coordinate systems

Module 1: (10 hours)

Basic Calculus: Review of Differentiation and Integration, Applications of differentiation, Definite integrals, Volumes using cross sections, Solids of revolution, Volumes using cylindrical shells, Arc length, Areas of surface of revolution. Double integrals, Area and Volume by double integration, Triple integrals.

Module 2: (10 hours)

Plane Curves: Parameterizations of plane curves, Calculus with parameterized curves**,** Polar coordinates, Areas and lengths in polar coordinates, Conic sections.

Vectors and the Geometry of Space: Three dimensional coordinate systems, Vectors, Lines and planes in space, Cylinders and quadric surfaces, Curves in space and their tangents, Arc length in space, Curvature, normal, velocity and acceleration.

Module 3: (10 hours)

Introduction to Spherical Trigonometry: Geometry of the sphere, Length of a circle arc, Spherical triangle, Cosine, sine and supplemental formulae, Solution of right angled triangles.

Curve Tracing: Asymptotes, Singular points, Tangents at the origin, Cusps, Tracing of Curves in Cartesian and Polar form.

Module 4: (9 hours)

Sequences and Series of real numbers and real functions of one variable, Convergence and Tests for convergence.

Mathematics in art: Fibonacci series and Golden ratio, Phillotaxis, Rectangular pentagon, Honeycombs and cracks, Tessellation and Penrose tiles.

Introduction to Fractals: Fractal shape, Properties and construction of fractals.

References:

1. G.B. Thomas, R.L. Finney, *Calculus and Analytical Geometry*, Addison-Wesley, 1998.
2. S. BalachandraRao, C K. Shantha, *Differential Calculus*, Wiley Eastern Ltd,. 2002.
3. Victor Gutenmacher and N B Vasilyev, *Lines and Curves: A Practical Geometry Handbook*, Birkhäuser, Boston, 2004.
4. Jr. Ayres Frank, Schaum's Outline Series - Theory and Problems of Plane and Spherical Trigonometry, 1954.
5. Michael F Barnsley*, Fractals Everywhere*, Academic Press Professional, Cambridge, 1993.
6. B.Mandelbrot, *The Fractal Geometry of Nature*, W.H Freeman and Company, New York, 1977.

MS1001D - PROFESSIONAL COMMUNICATION

Pre-requisites: Nil
.

Total hours: 39

L	T	P/D	C
3	0	0	3

Course Outcomes:

CO1: To distinguish the different types of meaning for constructive criticism, by developing a comprehensive understanding of the extensive vocabulary and usage in formal English language.

CO2: To learn and practice principles related to good formal writing.

CO3: To develop competence in group activities such as group discussions, debates, mock interviews, etc. by practicing the integration of unique qualities of nonverbal and verbal styles.

CO4: To deliver clear and effective presentation of ideas in the oral / written medium and to acquire the ability to modify it according to the target audience.

Module 1: (12 hours)

Role and importance of verbal communication, Everyday active vocabulary, Common words used in transitions, enhancing vocabulary, affixes and changes in pronunciation and grammatical functions, words often confused in pronunciation and usage. Passage comprehension- skimming, scanning techniques, note making, note taking and summarizing. Deciphering meaning from contexts.Two types of meaning- literal and contextual.Constructive criticism of speeches and explanations.

Module 2: (15 hours)

Fundamental grammar, Simple structures, passivizing the active sentences, reported speech, the judicious use of tenses and moods of verbs, forming questions and conversion from questions to statements and vice versa, forming open –ended and close- ended questions. Words and style used for formal and informal communication. Practice converting informal language to formal, the diction and the style of writing. Dealing with the nuances of ambiguous constructions in language.Learning authoritative writing skills, polite writing and good netiquette.Writing for internships and scholarships.

Module 3: (12 hours)

Kinesics, Proxemics, Haptics, and other areas of non-verbal communication, fighting communication barriers, positive grooming and activities on the same.Different types of interviews, and presentation- oral, poster, ppt. Organizing ideas for group discussions, the difference between GD and debates.

References:

1. Duck, Steve and David T. Macmahan. *Communication in Everyday Life*. 3rd Ed. Sage, 2017.
2. Quintanilla, Kelly M. and Shawn T. Wahl. *Business and Professional Communication*. Sage, 2016.
3. Gamble, Kawl Teri and Michael W. Gamble. *The Public Speaking Playbook*. Sage, 2015.
4. Tebeaux, Elizabeth and Sam Dragga. *The Essentials of Technical Communication*, 3rd Ed. OUP, 2015

5. Raman, Meenakshi and Sangeetha Sharma. *Technical Communication: Principles and Practice*, OUP, 2015
6. MacLennan, Jennifer. *Readings for Technical Communication*. OUP, 2007.

AP1001D - ARCHITECTURAL GRAPHICS - I

Pre-requisite: Nil

Total Hours: 26L+33D

L	T	P/D	C
2	0	3	3

Course Outcomes:

CO 1: To construct lines for different purposes, to demonstrate lettering and dimensioning

CO 2: To demonstrate lines and planes into drawings using orthographic projection

CO 3: To construct different solids and sectioned solids using orthographic projection

CO 4:To integrate two dimensional drawings and 3 dimension objects using development of surfaces of different solids

CO 5:To demonstrate intersection of solid and construct their development

Module 1: (5L + 6D)

Introduction to architectural graphics, drawing instruments and their uses, different type of lines, lettering and dimensioning.Familiarization with current BIS code of practice for architectural drawing.Basic geometric constructions -Plain Scale.

Two drawing exercises

Module 2: (7L + 9D)

Introduction to orthographic projections, Vertical and horizontal profile planes, Principles of first angle and third angle projections, projection of points in different quadrants, orthographic projections of lines, true length and inclination of lines with reference planes, traces of lines – Projection of planes - auxiliary projection.

Three drawing exercises

Module 3: (7l + 9d)

Projection of polyhedra and solids like cube, pyramid, prism, tetrahedron, octahedron, cone, cylinder and sphere - projection of solids on auxiliary planes - Section of solids, true shape of sections by projecting on auxiliary views.

Three drawing exercises

Module 4: (7L + 9D)

Development of surfaces of solids and sectioned solids – Development of solids like cube, pyramid, prism, tetrahedron, octahedron, cone, cylinder - Intersection of Surfaces: Methods of determining curves of intersection – Development of intersecting surfaces.

Three drawing exercises

References:

1. Ching D. K. Francis, *Architectural Graphics*, John Wiley and Sons, 2003.
2. John K. C., Varghese P I, *Engineering Graphics*, Jet Publications, Trichur, India, 2004.
3. Bhatt N. D., *Engineering Drawing*, CharotarPublising House, Anand, India, 2003.
4. Narayana K. L., Kannaiah P., *Engineering Graphics*, Sci Tech Publishers, Chennai, 2003.

AP1002D - HISTORY OF ARCHITECTURE - I

Pre-requisites: Nil

Total hours: 39

L	T	P/D	C
3	0	0	3

Course Outcomes:

CO1: To identify different styles of historic architecture
CO2: To identify prominent / important historic buildings by their components / style of design
CO3: Understand important historic buildings
CO4: Understand factors contributing to the design development of different styles.

Module 1: (9 hours)

Egyptian civilization:

Introduction to Egyptian civilization - systems and cultures - salient building types – Egyptian Temples & temple complexes - Cult Temple and Mortuary Temple - Mastaba – development and typical components of Pyramids – Complex of Zoser, Pyramid of Cheops and Chepren - Standard mortuary complex layout of pyramids - Introduction to Mesopotamian civilizations - social systems and cultures - Salient building types - Ziggurats and their development – White Temple, Ziggurat of Ur, Urnammu and Khorsabad- Generic Temple Layout - Temple Oval and Khafaje Palace Complex/Citadel of Khorsabad - Nebuchadnezzar's Babylon, Persepolis.

Module 2: (9 hours)

Greek and Roman Architecture:

Introduction to Greek civilization - social systems and cultures - classical Order – Doric, Ionic, Corinthian - Typical building types. Temple types on basis of column layout – case study of Acropolis, Athens - Hellenic Temple (Parthenon, Athens) versus Hellenistic Temple (Athena Polias, Priene). Public Buildings and Square – Agora, Stoa, Prytaneum, Bouleuterion, Tholos, Gymnasium, Theatre - Roman Architecture - Introduction to Roman civilization - social systems and cultures - new materials and new construction/structural systems, eg, Pozzolana, Concrete, Stone Blocks, Stone Masonry, Arch, Vault, Dome - typical buildings - Forums of Rome Pantheon, Aqueduct, Colosseum, Bath of Caracalla, Basilica of Trajan.

Module 3: (9 hours)

Early Christian, Romanesque & Byzantine Architecture:

Early Christian & Romanesque Architecture- society and culture of 400 -1150 AD in Europe - Development of Early Christian Church from Roman Basilica - Salient features– St. Peter's Basilica - Development of Romanesque architecture from Early Christian Architecture-Contribution of Byzantine architecture in the development of structural system – dome construction over square plan. Adoption of Greek cross in church layout-use of mosaics and murals - typical examples – Santa Sophia, Istanbul; St. Mark's Cathedral, Venice.

Module 4: (12 hours)

Gothic Architecture:

Origin of Gothic architecture and its development in various parts of Europe- structural innovations-Different arch types – pointed, lancet, equilateral, depressed - Trefoil arch -Cluster column and intersecting vault roof, clerestory window and triforium. Flying buttress-stained glass, stone and metal trellis, flamboyant window, rose window Salient features in the church entrance-examples- Cathedrals of St. Dennis, Cathedrals of Chartres, Cathedrals of Notre Dame (Paris) and Cathedrals of Reims. Comparison of English and French Gothic - Renaissance Architecture and its Classical Revivalism, Neo-Classicism - society and culture of 1400 -1800 AD - Evolution of Renaissance architecture into Early, Mature and Late periods. Innovation in structural system -ribbed dome, lantern dome etc.

References:
1. Banister Fletcher, A History of Architecture, CBS Publishers Delhi, 2002.
2. Patrick Nuttgens, *The Story of Architecture*, Phaidon Press, 1997.
3. Siegfried Gideon, *Space, Time and Architecture*, Harvard University Press, 2008.

AP1003D - INTRODUCTION TO ARCHITECTURAL DESIGN - I

Pre-requisites: Nil

L	T	P/D	C
0	0	6	4

Total hours: 78

Course Outcomes:
CO1: To comprehend the architectural design process.
CO2: To Generate designs using fundamental design principles.
CO3: To communicate and defend ideas through graphics, models and words.
CO4: To review the spatial relationships in the existing built environments.

This Design Studio aims to evolve students from diverse milieus to a focused training in analytical abilities and communication skills, visualisation and representation skills.

Projects:

1. Design space/s using line, plane, form and their inter-relationship – Emphasis on model study followed by graphical expression of spaces.
2. Design an installation- Emphasis on form, proportion and scale (eg.War Memorial in a park)- model study and graphical expression.
3. Design a hall without definite edge- Emphasis space, form, proportion, scale and environment- Model and graphics
4. Experience spaces through movement – walking through the campus or a small bazaar- emphasis on graphical expression of the gained experience
5. Study of anthropometrics to understand its role in determining space required for activities such as living, dining, sleeping and conveniences. - Design of mono-cellular architectural forms shall form the basic level of implementation and exploration for various design issues
6. Book Review – A detailed review of design related books and its presentation

References:
1. Ching D. K. Francis, *Architectural Graphics*, John Wiley and Sons, 2015.
2. Ching D. K. Francis, *Form, Space and order*, John Wiley and Sons, 2015.
3. Scott Robert Gilliam, *Design Fundamentals*, McGraw-Hill, 1951.
4. Smithies, K. W. *Principles of design in Architecture*, Van Nostrand Reinhold, New York, 1981
5. Ernest Burden, *Elements of Architectural Design photographic Sourcebook*, JohnWile & Sons, 2000
6. Holgate, Alen. *Aesthetics of Built Form*, Oxford University Press, 1992

AP1091D - FINE ARTS - I

Pre-requisites: Nil

L	T	P/T	C
0	0	3	2

Total hours: 39

Course Outcomes:
CO1: To comprehend the design principles within the domain of two-dimensional compositions
CO2: To Create two-dimensionalcompositions in various media & materials through hands-on experience
CO3: To demonstrate the creative instinct by being sensitive and more observant to nature
CO4: To critique visual relationships of two-dimensional compositions

This studio aims at building up the vocabulary in visual and basic design principles by polishing the skills of the hand through working with different mediums which will help to enhance the visual presentation.

Exercises:

1. Visual study of two-dimensional objects to identify various elements and compositional principles used. Projects should include the study of the figure and background relationships in complex visual patterns, Case study of tile and design.
2. Colour studies- Study and classification of colours with different Hues, Values & Shades Colour wheel and colour composition, properties (visual and psychological) of colour
3. Experiment and understand the potentials of various media & materials - Pencil, ink, crayon, pastels and watercolours. Background materials- types of papers, canvas
4. Promote observation of settings of singular and multiple physical objects- Form and in-between space, mass and void relationships of natural and manmade objects. Pencil and watercolour studies.
5. Two-dimensional compositions of various shapes and pattern - colour studies, textural studies, organisation, the geometric study of the proportion of Classical Architecture, Mass-void relationship through different period and preparation of study models.
6. Outdoor sketching of objects, spaces and massing. Perspective views, Quick sketches, Study of shades and shadows, Rendering. Techniques for depicting design/environmental quality and design presentation

References:
1. Ching D. K. Francis, *Architectural Graphics*, John Wiley and Sons, 2003.

2. Ching D. K. Francis, *Form, Space and order*, John Wiley and Sons, 2007.
3. Scott Robert Gilliam, *Design Fundamentals*, McGraw-Hill, 1951.
4. V.S.Parmer, *Design fundamentals in Architecture*, SomaiyaPublicationsPrivateLimited, New Delhi, 2010.
5. Guptill, Arthur Leighton. *Rendering with Pen & Ink*, Watson-Guptill Publications, 1997.

AP1092D - WORKSHOP

Pre-requisite: Nil

L	T	P/D	C
0	0	3	2

Total Hours: 39

Course Outcomes:
CO 1: To prepare carpentry joints and make models of wood
CO 2: To work out and execute plumbing work
CO 3: To prepare models out of hard board or such suitable material
CO 4: To prepare architectural models out of suitable material

Module 1: (12 hours)
Hands on training on carpentry and Plumbing: Introduction to various tools and processes used for carpentry – exercise on marking, cutting, planning etc. - preparation of simple models and carpentry joints – Introduction to various tools and processes used for plumbing using GI and PVC pipes and accessories – threading of GI pipes, connections – connecting PVC pipes and plumbing fittings.

Module 2: (12 hours)
Hands on training on Electrical Wiring: Introduction to various tools and processes used for electrical wiring – introduction to wiring systems - Wiring of one lamp - Selection of fuse, MCB and ELCB - Wiring of a fluorescent lamp controlled by one switch from a panel with ELCB&MCB.
Introduction to electronic components colour code - multimeters - Study of soldering components - solders, tools, heat sink - Soldering practice- Inverting Amplifier

Module 3: (6 hours)
Hands on training on model making: Introduction to various tools, material and processes used for model making – exercise on model making using hard board, mount board, thermocol, perspex etc.- model of simple solids and complex solids – model making using clay and other similar materials.

Module 4: (6 hours)
Hands on training on architectural model making: Introduction to various tools, material and processes used for architectural models – exercise on model making of buildings (historic and contemporary) – Introduction to computer aided model making using 3D printing, CNC machines etc.

References:
1. Burbank, Nelson, *House Carpentry Simplified*, McGraw Hill Publications, NY, 1986.
2. KrendliseL.N.,*Wood working*, MIR Publications, Moscow, 1984.
3. Husain S.K., *Text book of Water supply and sanitation engineering*, Oxford &IBH, 1995.

4. RainaK.B , Bhattacharya S.K, *Electrical Design Estimating and Costing*, New Age International Publishers, New Delhi, 2005.
5. Uppal S. L., *Electrical Wiring & Estimating*, Khanna Publishers---5th edition, 2003.
6. G. Randy Slone - *Tab Electronics Guide to Understanding Electricity and Electronics*, McGrawHill, 2000.
7. Jerry C Whitaker - *The Resource Handbook of Electronics*, CRC Press, 2001.

BT1001D - INTRODUCTION TO LIFE SCIENCE

Pre-requisites: Nil

L	T	P/D	C
2	0	0	2

Total hours: 26

Course Outcomes:
CO1: To comprehend the chemical and molecular basis of life
CO2: To summarize about the basic molecules of life- proteins, lipids, DNA, and RNA
CO3: To develop idea about cell, its structure, functions and significance of compartmentalization
CO4: Tol describe the concepts in ecology and biodiversity and its impact on global change

Module 1: (9 hours)
Origin and evolution of life, Biogenesis and Louis Pasteur, Oparin-Haldane hypothesis, Darwin's view on natural selection.unity and diversity of life, Chemistry of life, introduction to structure and function of the biological macromolecules like carbohydrates, proteins, lipids, DNA and RNA

Module 2: (9 hours)
Prokaryotic and eukaryotic cells, structure and organization of cells, intracellular compartmentalization, functions of various organelles. Extracellular components and cell-cell communication, overview of Mitosis and Meiosis, basic concepts in energy transformation and photosynthesis.

Module 3: (8 hours)
Principles of Mendelian inheritance and chromosomal basis of heredity, linked genes, genetic disorder.Ecosystems and restoration ecology, energy flow, chemical and nutrient cycling, primary production in ecosystems, conservation of biodiversity.

References:
1. L. A. Urry, M. L. Cain, S. A. Wasserman, P. V. Minorsky, and J. B. Reece, *Campbell Biology*, 11th Edn. Pearson 2017
2. D. L. Nelson, and M. M. Cox, *Lehninger Principles of Biochemistry*, 4th Edn, WH Freeman and Company, 2005.
3. C. Starr, C. Evers, L. Starr, *Biochemistry, Biology: Concepts and Applications*, 10th Edn, 2017.
4. J.M. Berg, J.L. Tymoczko, and L. Stryer, *Biochemistry*, 6[th]Edn., W H Freeman and Company, 2007.
5. H. Lodish, A. Berk, C. A. Kaiser, and M. Krieger, *Molecular Cell Biology*, 6[th]Edn., W. H. Freeman, 2007.

AP1004D - ARCHITECTURAL GRAPHICS - II

Pre-requisite: AP1001D – ARCHITECTURAL GRAPHICS - I

L	T	P/D	C
2	0	3	3

Total Hours: 26L+33D

Course Outcomes:
CO 1: To construct different solids using different three dimensional projections from orthographic projection and vis-a-versa
CO 2: To draw perspective projections of solids
CO 3: To prepare perspective views of buildings and interiors
CO 4: To prepare presentation drawings with sciography

Module 1: (8L + 9D)
Pictorial projections –axonometric, cavalier, cabinet and general oblique projections of solids and simple objects –Introduction to isometric projection, isometric scale – Isometric projections of prisms, pyramids, cylinders, cones, spheres, sectioned solids and combinations from orthographic - Isometric views.
Conversion of pictorial views into orthographic views –Procedure for preparing scaled drawing – simple building elements – furniture etc.
Three drawing exercises
Module 2: (6L + 9D)
Perspective projection – definition of perspective elements – station point, picture plane, horizon plane, central plane etc. - Visual ray method and vanishing point method – one point – two point and three point perspectives – Perspectives of simple solids and combination solids.
Three drawing exercises
Module 3: (6L + 9D)
Perspective views of buildings, and interiors - Approximate methods of perspective drawing.
Three drawing exercises
Module 4: (6L + 6D)
Sciography – introduction – principles of shades and shadows – shadows of lines, plane, simple solids and combination solids – Application of sciography on pictorial views.

Two drawing exercises

References:
1. Ching D. K. Francis, *Architectural Graphics*, John Wiley and Sons, 2003.
2. John K. C., Varghese P I, *Engineering Graphics*, Jet Publications, Trichur, India, 2004.
3. Bhatt N. D., *Engineering Drawing*, CharotarPublising House, Anand, India, 2003.
4. Narayana K. L., Kannaiah P., *Engineering Graphics*, Sci Tech Publishers, Chennai, 2003.
5. Shankar Mulik, *Perspectives and Sciography*, Allied Publishers, India, 1999.

AP1005D - APPLIED MECHANICS

Pre-requisites: Nil

L	T	P/D	C
3	1	0	3

Total hours: 52

Course Outcomes:
CO1: To evaluate the basic principles of mechanics that would be pertinent to simple design elements
CO2: To analyse statically determinate structures including trusses using equations of equilibrium
CO3: To compute the shear force and bending moment for various loading conditions
CO4: To compute frictional forces acting on a body
CO5: To determine sectional properties for various sections

Module 1: (9+2 hours)
*Fundamentals of mechanics:*Introduction - basic dimensions and units of mechanics - law of dimensional homogeneity - dimensional relations between force and mass - units of mass - idealizations of mechanics - vector and scalar quantities - equality and equivalence of vectors - laws of mechanics.
*Important vector quantities:*Elements of vector algebra - position vector - moment of a force about a point - moment of a force about an axis - the couple and couple moment - couple moment as a free vector - addition and subtraction of couples - moment of a couple about a line.
*Equivalent force systems:*Translation of a force to a parallel position - resultant of a force system - simplest resultant of special force systems - distributed force systems.

Module 2: (9+3 hours)
*Equations of equilibrium:*Free body diagram - free bodies involving interior sections - general equations of equilibrium - problems of equilibrium - static indeterminacy.

Module 3: (10+4 hours)
*Introduction to structural mechanics:*Trusses-The structural model - the simple truss - solution of simple trusses - method of joints - method of sections.
*Section forces in beams:*Different types of beams - shear forces and bending moment diagrams for simply supported, cantilever and over hanging beams.

Module 4: (11+4 hours)
*Friction forces:*Laws of Coulomb friction - simple contact friction problems.
Properties of surfaces: First moment – centroid - second moments and the product of a plane area, transfer theorems - rotation of axes - polar moment of area - principal axes - concept of second order tensor transformation.

References:
1. I.H.Shames, G.K. M. Rao, *Engineering Mechanics—Statics and Dynamics*, Person Education India, 2005.

2. F.P. Beer and E.R. Johnston, *Vector Mechanics for Engineers – Statics*, McGraw Hill Book Company, 2013.
3. J.L. Meriam and L.G. Kraige, *Engineering Mechanics – Statics*, 6[th]edition, John Wiley & Sons, 2010.
4. S. Timoshenko, D. H. Young, J.V. Rao, P. Sukumar, *Engineering Mechanics,* McGraw Hill Book Company, 2013.

AP1006D - HISTORY OF ARCHITECTURE - II

Pre-requisites: AP1002D - History of Architecture - I

Total hours: 39

L	T	P/D	C
3	0	0	3

Course Outcomes:
CO1: To comprehend architecture of the India and its evolution in various periods
CO2: To understand contributing factors for the design development of different styles
CO3: To understand important historic buildings
CO4: To Compare and Contrast various styles

Module 1: (9 hours)
*Vedic and Buddhist Architecture:*Introduction to vedic era, society and culture, later vedic era: janapadas, rise of mahajanapadas, Magadha - Architectural treaties and writings. Study of vedic panels of gateway - Architecture of Indus valley - Vedic religion & Vedic gramas.; Introduction to new religion - Architectural features: Sanghas and Viharas, Buddhist Architecture: Asokan school, Monolithic pillars - evolution of Chaitya halls - Viharas&Stupas at Orissa, Bihar, Maharastra, Madhya Pradesh, Andhra Pradesh.

Module 2: (10 hours)
*Hindu Architecture:*Birth of Jainism; - viharas, Temples of Rajasthan, Gujarat, Central India - temporary shelters - Prominent Sites: Ajantha and Ellora cave-, Nalanda and Taxila. Dravidian architecture, BadamiChalukya Architecture. Rock cut Architectural features: stupas, rock edicts, pillar edicts - Birth of Hinduism- Evolution of Hindu temples under Guptas, Chalukyas at Aihole - under Rastrakutas-at Ellora; Origin of Dravidian Architecture under Pallavas- Rockcutmandapas, Rathas, & temples. Evolution of Gopurams under Cholas.Vijyanagar-Hampi temples under Nayaks- at Madura. Introduction to Mauryanempire, life and culture -

Module 3: (10 hours)
Indo-Islamic Architecture: Early Islamic architecture in India (A.D. 1200 to 1290) - Qutub complex The Sayyid and the lodi dynasties, Provincial styles (Bengal, Gujrat, Malwa, Deccan) - Islamic architecture under provincial style: Islamic architecture of north and east India- of Punjab, Jaunpur, Bengal- Gateways and mosques; Islamic style in west and central India- Gujarat and Malwaplateau. Mosques, secular buildings; Islamic style of Deccan Plateau -Gulbarga, Bidar, Golconda, Bijapur- Mosques, Gateways, Tombs Architectural features: Minars, minarets, towers and turrets, domes, The buildings of the Khalji dynasty - imperial style -tughlaq dynasty- Lodhi, Sayyid Prominent Sites. Tomb of ghiyasud din Tughlaq, three cities of TughlaqKhirki Masjid o Stepped well BaiHari, Rauza, Sayed mosque Ahmedabad -

Jaunpur mosques, Jami masjid Atala masjid, Cambay jami masjid, Ahmedabad: tin darwaza, jami masjid, Bijapur : Ibrahim rauza -Mughals in India-synthesis of Hindu-Muslim culture,outline of Mughal cities and gardens under the Mughal rulers- examples. Mixed Styles-Hindu-islamic Styles-Rajput style

Module 4: (10 hours)

*Colonial Architecture in India:*West.Colonial style in India under Portuguese, Dutch, French, and English - Forts, Railway stations, Churches - Indo gothic, French, Dutch and Portuguese architecture in India - Architectural Features-Prominent Sites - French settlement Pondicherry, Portuguese settlement in Goa. Basilica of BomJesus, ChhatrapatiShivaji terminus.

References:

1. S. Grover, *The Architecture of India, Buddhist & Hindu*, Read Books, 2010.
2. S. Grover, *Islamic Architecture in India*, CBS Publishers & Distributors, 2009
3. Catherine B. Asher, *Architecture of Mughal India*, Cambridge University Press, 2002
4. Patrick Nuttgens, *The Story of Architecture*, Phaidon Press, 1997.
5. Siegfried Gideon, *Space, Time and Architecture*, Harvard University Press, 2008.
6. Percy Brown, *Indian Architecture: Islamic Period*, CBS Publishers Delhi, 2014.
7. Jemes Fergusson, *History of Indian and Eastern Architecture*, Rupa Publishers, 2011.

AP1007D – THEORY OF DESIGN

Pre-requisite: Nil

L	T	P/D	C
3	0	0	3

Total Hours: 39

Course Outcomes:

CO 1: To comprehend design principles
CO 2: To demonstrate principles of visual design
CO 3: To develop design process based on principles
CO 4: To analyze interior and exterior spaces

Module 1: (10 hours)

Architectural Theory in Historical Perspective: Definition of architecture; design principles, historic evolution in architecture, justification for architectural design; role of designer- social context, functional design, scope of design- integration of function and aesthetics. Behavioral aspects of the user-deterministic methods and models adopted in design.Concept of creativity; issues of creative design.

Module 2: (10 hours)

Visual Design Principles: Functional, structural and spatial systems- elements and principles of design. Principles of visual design: balance, rhythm, proportions, scale, unity and character. Relation of form and space.Use of light, shade and colour - Architectural programming principles.-functionalism, organic architecture; modern and post-modernistic theories and contemporary movements in architecture.

Module 3: (10 hours)

Design Process: Design approaches: Pragmatic design, iconic design, analogic design, canonic design. Schematic design, symbolism and conceptual design. Various stages of design development and construction of design, New techniques in analysis of spatial relations, spatial relations expressed in the form of bubble diagram and circulation pattern. Proximity matrix and method of overlays in design decision-making. History & Principles of Visual Simulation Presentation of design scheme through graphics, scale models, CAD, Photo and Video simulations, Holograms. Value engineering concepts and its application in design evaluation.

Module 4: (9 hours)

Interiors and Exteriors: Building envelope as a space definer element, characteristics of interior space, activity space and tolerance; ergonomics. Building exterior and relating the form with environment. Design of visual sequences of spaces- Greek and modern examples. Case study of important buildings

References:
1. Broadbent G, *Design in Architecture*, Routledge, 1997.
2. Ashihara Y, *Exterior Design in Architecture*, Van Nostrand Reinhold, New York, 1981.
3. Stevens Garry, *The Reasoning Architect- Mathematics &Science in Design*, McGraw Hill, 1990.
4. Ghirardo Diane, *Architecture after modernism*, Thames and Hudson, 1996.
5. Sheppard, Stephen. R.J, *Visual Simulation*, John Wiley & Sons Inc, 1989.
6. Porter, Tom, *How Architects Visualize*, Macmillan Publishing Co., Inc., New York, 1979.
7. Johnson, Paul-Alan, *The theory of Architecture,* John Wiley & Sons, 1994.

AP1008D - INTRODUCTION TO ARCHITECTURAL DESIGN - II

Pre-requisites: AP1003D - Introduction to Architectural Design – I

L	T	P/D	C
0	0	6	4

Total hours: 78

Course Outcomes:

CO1: To interpret architectural program requirements by transforming personal experiences to behavioural needs

CO2: To develop a design concept from internal and external set of relationships

CO3: To demonstrate architectural drafting style to translate and communicate design aspects

CO4: To analyse a link between Architecture, Man and Environment

This studio broadens the concepts introduced in the previous semester studio and grooms the student for architectural design. The studio equips the student to understand man-space, activity-space and form-space relationships as essential design generators and also familiarises the concept of function as a determinant of form and space.

Projects:

1. Measured drawing of a simple existing building – emphasis on drafting practices and quality
2. Design a lobby space- focus on anthropometrics and space modulations-Model and graphics
3. Design a house without rooms - stressing on space, form, proportion, scale and environment - Model and graphics
4. Experience structure through observation – study of natural objects and model its structure - graphical expression of the gained experience
5. Design of simple (single level) multi-cellular architectural form – Importance on design aspects like light and ventilation, scale, and proportions in architectural design
6. Design of a simple building in the immediate or observable environment - Systematic introduction to issues about the design of human habitat, its components and space standards

References:
1. Ching D. K. Francis, *Architectural Graphics*, John Wiley and Sons, 2015.
2. Ching D. K. Francis, *Form, Space and order*, John Wiley and Sons, 2015.
3. Scott Robert Gilliam, *Design Fundamentals*, McGraw-Hill, 1951.
4. Smithies, K. W. *Principles of design in Architecture*, Van Nostrand Reinhold, New York, 1981.
5. Ernest Burden, *Elements of Architectural Design photographic Sourcebook*, John Wile & Sons, 2000.
6. Holgate, Alen. *Aesthetics of Built Form*, Oxford University Press, 1992.

AP1093D - FINE ARTS - II

Pre-requisites: AP1091D - Fine Arts - I

L	T	P/T	C
0	0	3	2

Total hours: 39

Course Outcomes:
CO1: To comprehend the design principles within the domain of three-dimensional compositions
CO2: Evaluate the three - dimensional compositions present in natural and man- made objects
CO3: Create Three-dimensionalcompositions in various media & materials through hands-onexperience
CO4: To critique visual relationships of three-dimensional compositions

This studio aims in developing three-dimension visualization and understanding of material limits which will contribute to the enrichment of architectural design in subsequent semesters

Exercises:

1. Visual composition element studies: - Exploring the importance of visual composition elements like dots, lines, planes, shapes & patterns, in complex three- dimensional compositions in Architectural examples of late 20th century.

2. Visual composition principle studies: - Understating the visualcomposition principles like Rhythm, Balance, proportion, repetition, focal point, symmetry, harmony, and direction, etc. by conducting a form analysis study of famous modern & historic building.

3. Observational studies: - Study of singular and multiple physical objects from nature by analysing its form and in-between space, mass and void relationships,etc. and expressed interms ofphysical model using plastic materials like clay, plaster of Paris, etc. Application of the potentials of various media like colours& textures shall be used in this project

4. Material studies: - Study of the possibilities of different materials like paper, wire, etc. The project shall include design of architectural spaces using folded paper forms & wire sculptures etc.

5. Design and fabrication of kinetic and static sculpture and architectonic forms.

References:

1. Ching D. K. Francis, *Architectural Graphics*, John Wiley and Sons, 2003.
2. Ching D. K. Francis, *Form, Space and order*, John Wiley and Sons, 2007.
3. Scott Robert Gilliam, *Design Fundamentals*, McGraw-Hill, 1951.
4. V.S.Parmer, *Design fundamentals in Architecture*, SomaiyaPublicationsPrivateLimited, New Delhi, 2010.
5. Guptill, Arthur Leighton. *Rendering with Pen & Ink*, Watson-Guptill Publications, 1997.

3.2 CURRICULUM B.TECH

Semester I

Sl. No.	Course Code	Course Title	L	T	P	Credits	Category
1	MA1001D	Mathematics I	3	1	0	3	MA
2	PH1001D/ CY1001D	Physics/Chemistry	3	0	0	3	BS
3	MS1001D/ ZZ1003D	Professional Communication/ Basic Electrical Sciences	3	0	0	3	HL/BE
4	ZZ1001D/ ZZ1002D	Engineering Mechanics/ Engineering Graphics	3/2	0	0/2	3	BE
5	ZZ1004D/ BT1001D	Computer Programming / Introduction to Life Science	2	0	0	2	BE/BS
6	PH1091D/ CY1094D	Physics Lab/ Chemistry Lab	0	0	2	1	BS
7	ZZ1091D/ ZZ1092D	Workshop I/Workshop II	0	0	3	2	BE
8	ZZ1093D/ ZZ1094D/ ZZ1095D	Physical Education /Value Education/ NSS	-	-	-	3*	OT
	Total Credits		14/13	1	5/7	17+3*	

*Note: Three courses of 1 credit each has to be credited within the first four semesters.

Semester II

Sl. No.	Course Code	Course Title	L	T	P	Credits	Category
1	MA1002D	Mathematics II	3	1	0	3	MA
2	CY1001D/ PH1001D	Chemistry/ Physics	3	0	0	3	BS
3	ZZ1003D/ MS1001D	Basic Electrical Sciences/ Professional Communication	3	0	0	3	BE/HL
4	ZZ1002D/ ZZ1001D	Engineering Graphics/ Engineering Mechanics	2/3	0	2/0	3	BE
5	BT1001D/ ZZ1004D	Introduction to Life Science./Computer Programming	2	0	0	2	BS/BE
6	CY1094D/ PH1091D	Chemistry Lab / Physics Lab	0	0	2	1	BS
7	ZZ1092D/ ZZ1091D	Workshop II/ Workshop I	0	0	3	2	BE
	Total Credits		13/14	1	7/5	17	

MA1001D MATHEMATICS I

Pre-requisites: Nil

L	T	P	C
3	1	0	3

Total hours: 39

Course Outcomes:

CO1: Find the limits, check for the continuity and differentiability of functions of a single variable as well as several variables.

CO2: Test for the convergence of sequences and series of numbers as well as functions.

CO3: Formulate different mensuration problems as multiple integrals and evaluate them.

CO4: Use techniques in vector differential calculus to solve problems related to curvature, surface normal and directional derivative.

CO5: Find the parametric representation of curves and surfaces in space and will be able to evaluate the integral of functions over curves and surfaces.

Module 1: (13 hours)

Real valued function of real variable: Limit, Continuity, Differentiability, Local maxima and local minima, Curve sketching, Mean value theorems, Higher order derivatives, Taylor's theorem, Integration, Area under the curve, Improper integrals.

Function of several variables: Limit, Continuity, Partial derivatives, Partial differentiation of composite functions, Differentiation under the integral sign, Local maxima and local minima, Saddle point, Taylor's theorem, Hessian, Method of Lagrange multipliers.

Module 2: (13 hours)

Numerical sequences, Cauchy sequence, Convergence, Numerical series, Convergence, Tests for convergence, Absolute convergence, Sequence and series of functions, point-wise and uniform convergence, Power series, Radius of convergence, Taylor series.

Double integral, Triple integral, Change of variables, Jacobian, Polar coordinates, Applications of multiple integrals.

Module 3: (13 hours)

Parameterised curves in space, Arc length, Tangent and normal vectors, Curvature and torsion, Line integral, Gradient, Directional derivatives, Tangent plane and normal vector, Vector field, Divergence, Curl, Related identities, Scalar potential, Parameterised surface, Surface integral, Applications of surface integral, Integral theorems: Green's Theorem, Stokes' theorem, Gauss' divergence theorem, Applications of vector integrals.

References:

1. H. Anton, I. BivensandS. Davis, Calculus, 10th edition, New York: John Wiley & Sons, 2015.
2. G. B. Thomas, M.D. WeirandJ. Hass, Thomas' Calculus, 12th edition, New Delhi, India: Pearson Education, 2015.
3. E. Kreyszig, Advanced Engineering Mathematics, 10th edition, New York: John Wiley & Sons, 2015.
4. Apostol, CalculusVol 1, 1st ed. New Delhi: Wiley, 2014

MA1002D MATHEMATICS II

Pre-requisites: Nil

L	T	P	C
3	1	0	3

Total hours: 39

Course Outcomes

CO1: Test the consistency of system of linear equations and then solve it.
CO2: Test for linear independence of vectors and perform orthogonalisation of basis vectors.
CO3: Diagonalise symmetric matrices and use it to find the nature of quadratic forms.
CO4: Formulate some engineering problems as ODEs and hence solve them.
CO5: Use Laplace transform and its properties to solve differential equations and integral equations.

Module 1: (16 hours)

System of Linear equations, Gauss elimination, Solution by LU decomposition, Determinant, Rank of a matrix, Linear independence, Consistency of linear system, General form of solution.

Vector spaces, Subspaces, Basis and dimension, Linear transformation, Rank-nullity theorem, Inner-product, Orthogonal set, Gram-Schmidt orthogonalisation, Matrix representation of linear transformation, Basis changing rule.

Types of matrices and their properties, Eigenvalue, Eigenvector, Eigenvalue problems, Cayley-Hamiltonian theorem and its applications, Similarity of matrices, Diagonalisation, Quadratic form, Reduction to canonical form.

Module 2: (13 hours)

Ordinary Differential Equations (ODE): Formation of ODE, Existence and uniqueness solution of first order ODE using examples, Methods of solutions of first order ODE, Applications of first order ODE.

Linear ODE: Homogenous equations, Fundamental system of solutions, Wronskian, Solution of second order non-homogeneous ODE with constant coefficients: Method of variation of parameters, Method of undetermined coefficients, Euler-Cauchy equations, Applications to engineering problems, System of linear ODEs with constant coefficients.

Module 3: (10 hours)

Gamma function, Beta function: Properties and evaluation of integrals.

Laplace transform, Necessary condition for existence, General properties, Inverse Laplace transform, Transforms of derivatives and integrals, Differentiation and Integration of transform, Unit-step function, Shifting theorems, Transforms of periodic functions, Convolution, Solution of differential equations and integral equations using Laplace transform.

References:

1. E. Kreyszig, Advanced Engineering Mathematics, 10th edition, New Delhi, India: Wiley, 2015.
2. G. Strang, Introduction to Linear Algebra, Wellesley MA: Cambridge Press, 2016.
3. R. P. Agarwal and D. O'Regan, An Introduction to Ordinary Differential Equations, New York: Springer, 2008.
4. V. I. Arnold, Ordinary Differential Equations, New York: Springer, 2006.
5. P. Dyke, An Introduction to Laplace Transforms and Fourier Series, New York: Springer, 2014.

PH1001D PHYSICS

Pre-requisites: Nil

L	T	P	C
3	0	0	3

Total hours: 39

Course Outcomes:

CO1: To enable students to apply relevant fundamental principles of modern physics to problems in engineering.

CO2: To develop knowledge of basic principles of Quantum Physics

CO3: Acquire knowledge of the basic physics of a collection of particles and the emergent macroscopic properties.

CO4: Apply principles of quantum and statistical physics to understand properties of materials

Module 1: (12 hours):

Particle nature of radiation – Photoelectric effect, Compton effect, Wave nature of matter – matter waves, wave packets description, phase and group velocity, uncertainty principle. Formulation of Schrödinger equation, physical meaning of wave function, expectation values, time-independent Schrödinger equation, quantization of energy for bound particles. Application of time-independent Schrödinger equation to free particle, infinite well, finite well, barrier potential, tunneling.

Module 2: (14 hours):

Simple Harmonic Oscillator, two-dimensional square box, the scanning tunneling microscope. Wave function for two or more particles, indistinguishable particles, symmetry and anti-symmetry under exchange of particles, Pauli's exclusion principle, electronic configurations of atoms. Quantum model of a solid – periodicity of potential and bands, $E – k$ diagram, effective mass, band gap.

Module 3: (13 hours):

Microstates and macrostates of a system, equal probability hypothesis, Boltzman factor and distribution, ideal gas, equipartition of energy, Maxwell speed distribution, average speed, RMS speed, Quantum distributions - Bosons and Fermions, Bose-Einstein and Fermi-Dirac distribution, applications.

References:

1. Kenneth Krane, Modern Physics, 2nd Ed., Wiley (2009)
2. Arthur Beiser, Concepts of Modern Physics, 6th Ed., Tata Mc Graw –Hill Publication (2009)
3. Robert Eisberg and Robert Resnick, Quantum Physics of atoms, Molecules, Solids, Nuclei and Particle, 2nd Ed., John Wiley(2006)
4. David Halliday, Robert Resnick and Jearl Walker, Fundamentals of Physics, 6th Ed., Wiley (2004)

CY1001D CHEMISTRY

Pre-requisites: Nil

L	T	P	C
3	0	0	3

Total hours: 39

Course Outcomes:

CO1: Acquire knowledge about separation strategies, identification and characterization of molecules

CO2: Understand the causes and mechanism of corrosion and understand its prevention methods

CO3: Attain knowledge about electrochemical reactions and their current applications

CO4: Comprehend the principles of industrial catalytic processes and enzyme catalysis

Module 1: (14 hours)

Spectroscopy – General Principles, Infrared, group frequencies, Electronic spectroscopy of conjugated molecules, Woodward-Fieser Rule.

Chromatography – Retention and separation factors, theoretical plates, instrumentation and uses of gas chromatography and high performance liquid chromatography

Thermal analysis – Thermogravimetry, Differential Scanning Calorimetry and Differential Thermal Analysis

Module 2: (12 hours)

Electrochemical corrosion – mechanisms, control and prevention.

Cyclic voltammetry, switching potentials, cathodic and anodic peak currents potentiometry, fuel cells – types and applications

Liquid crystals – Phase types, uses in displays and thermography.

Module 3: (13 hours)

Catalysis – Homogeneous and heterogeneous catalysis, organometallic compounds, 18-electron rule, Oxidative addition, reductive elimination, insertion and elimination reactions, Wilkinson's catalyst in alkene hydrogenation, Zeigler-Natta catalysis in polymerization of olefins.

Enzyme catalysis – mechanisms, significance of Michaelis – Menten constant, turnover number, Co-enzymes and cofactors

References:

1. C. N. Banwell and E. M. McCash, *Fundamentals of Molecular Spectroscopy*, 4th edition, Tata McGraw Hill, New Delhi, 2010.
2. D. A. Skoog and D. M. West, F. J. Holler and S. R. Crouch, *Fundamentals of Analytical Chemistry*, BrooksCole, Florence, 2004.
3. H. H. Williard, L. L. Merrit, J. A. Dean and F. A. Settle, *Instrumental Methods of Analysis*, Wadsworth Publishing Company, Belmont, California, 1986.
4. B. R. Puri, L. R. Sharma, M. S. Pathania, *Principles of Physical Chemistry,* Vishal Publishing*, New Delhi,2000.
5. J. E. Huheey, E.A. Keiter and R.L. Keiter, *Inorganic Chemistry, Principles of Structure and Reactivity*, 4th Ed, Harper Collins College Publishers, New York, 1993.
6. C. Elschenbroich, *Organometallics*, 3rd edition, Wiley-VCH Verlag GmbH, Weinheim, 2006.

MS1001D PROFESSIONAL COMMUNICATION

Pre-requisites: Nil

.

Total hours: 39

L	T	P	C
3	0	0	3

Course Outcomes

CO1: Distinguish the different types of meaning for constructive criticism, by developing a comprehensive understanding of the extensive vocabulary and usage in formal English language.

CO2: Learn and practice principles related to good formal writing.

CO3: Develop competence in group activities such as group discussions, debates, mock interviews, etc. by practicing the integration of unique qualities of nonverbal and verbal styles.

CO4: Deliver clear and effective presentation of ideas in the oral / written medium and to acquire the ability to modify it according to the target audience.

Module 1: (12 hours)

Role and importance of verbal communication, Everyday active vocabulary, Common words used in transitions, enhancing vocabulary, affixes and changes in pronunciation and grammatical functions, words often confused in pronunciation and usage. Passage comprehension- skimming, scanning techniques, note making, note taking and summarizing. Deciphering meaning from contexts.Two types of meaning- literal and contextual.Constructive criticism of speeches and explanations.

Module 2: (15 hours)

Fundamental grammar, Simple structures, passivizing the active sentences, reported speech, the judicious use of tenses and moods of verbs, forming questions and conversion from questions to statements and vice versa, forming open –ended and close- ended questions. Words and style used for formal and informal communication. Practice converting informal language to formal, the diction and the style of writing. Dealing with the nuances of ambiguous constructions in language.Learning authoritative writing skills, polite writing and good netiquette.Writing for internships and scholarships.

Module 3: (12 hours)

Kinesics, Proxemics, Haptics, and other areas of non-verbal communication, fighting communication barriers, positive grooming and activities on the same.Different types of interviews, and presentation-oral, poster, ppt. Organizing ideas for group discussions, the difference between GD and debates.

References:

7. Duck, Steve and David T. Macmahan. *Communication in Everyday Life*. 3rd Ed. Sage, 2017.
8. Quintanilla, Kelly M. and Shawn T. Wahl. *Business and Professional Communication*. Sage, 2016.
9. Gamble, Kawl Teri and Michael W. Gamble. *The Public Speaking Playbook*. Sage, 2015.
10. Tebeaux, Elizabeth and Sam Dragga. *The Essentials of Technical Communication*, 3rd Ed. OUP, 2015
11. Raman, Meenakshi and Sangeetha Sharma. *Technical Communication: Principles and Practice*, OUP, 2015
12. MacLennan, Jennifer. *Readings for Technical Communication*. OUP, 2007.

ZZ1001D ENGINEERING MECHANICS

Pre-requisites: Nil

L	T	P	C
3	0	0	3

Total hours: 39
Course Outcomes:
CO1: Determine the resultants of a force system
CO2: Solve rigid body statics problems using equations of equilibrium and principle of virtual work
CO3: Perform kinematic analysis of a particle
CO4: Solve particle dynamics problems using Newton's laws, energy methods and momentum methods

Module 1: Basic Concepts (13 hours)
Introduction: idealizations of mechanics, vector and scalar quantities, equality and equivalence of vectors, laws of mechanics, elements of vector algebra.
Important vector quantities: position vector, moment of a force about a point, moment of a force about an axis, the couple and couple moment, couple moment as a free vector, moment of a couple about a line.
Equivalent force systems: translation of a force to a parallel position, resultant of a force system, simplest resultant of special force systems, distributed force systems, reduction of general force system to a wrench.

Module 2: Statics (13 hours)

Equations of equilibrium: free-body diagram, free bodies involving interior sections, general equations of equilibrium, problems of equilibrium, static indeterminacy.
Applications of equations of equilibrium: Trusses: solution of simple trusses using method of joints and method of sections; Friction forces: laws of Coulomb friction, simple contact friction problems; Cables and chains.
Properties of surfaces: first moment and centroid of plane area, second moments and product of area for a plane area, transfer theorems, rotation of axes, polar moment of area, principal axes.
Method of virtual work: principles of virtual work for rigid bodies and its applications.

Module 3: Dynamics (13 hours)
Kinematics of a particle: introduction, general notions, differentiation of a vector with respect to time, velocity and acceleration calculations in rectangular coordinates, velocity and acceleration in terms of path variables and cylindrical coordinates, simple kinematical relations and applications.

Dynamics of a particle: introduction, Newton's law for rectangular coordinates, rectilinear translation, Newton's law for cylindrical coordinates, Newton's law for path variables, energy and momentum methods: introduction, conservative force field, conservation of mechanical energy, alternative form of work-energy equation, impulse and momentum relations, moment-of-momentum equation.

References:

1. I. H. Shames, *Engineering Mechanics—Statics and Dynamics*, 4th Edition, Prentice Hall of India, 1996.
2. F.P. Beer and E.R. Johnston, *Vector Mechanics for Engineers – Statics,* McGraw Hill Book Company, 2000.
3. J.L. Meriam and L.G. Kraige, *Engineering Mechanics – Statics*, John Wiley & Sons, 2002.
4. R.C Hibbler, Engineering Mechanics—Statics and Dynamics, 11th Edition, Pearson, India, 2009

ZZ1002D ENGINEERING GRAPHICS

Pre-requisites: Nil

L	T	P	C
2	0	2	3

Total hours: 52

Course Outcomes:

CO1: Make use of the Indian Standard Code of Practice in Engineering Drawing.
CO2: Represent any engineering object by its orthographic views.
CO3: Convert orthographic viewsof an engineering object into its isometric view.
CO4:Enhance the capacity of visualization of engineering objects.

Module 1: (15 hours)

Introduction; drawing instruments and their uses; lines, lettering and dimensioning; geometrical construction; constructions of plain, diagonal and vernier scales; orthographic projection—first and third angle projections; orthographic projection of points on principal, profile, and auxiliary planes.

Module 2: (17 hours)

Orthographic projection of straight line in simple and oblique positions; application of orthographic projection of line; orthographic projection of planes in simple and oblique position on principal and profile planes; orthographic projection of lines and planes on auxiliary planes.

Module 3: (20 hours)

Orthographic projection of solids in simple and oblique positions on principal and profile planes; orthographic projections of solids in oblique position using auxiliary plane method; orthographic projection of spheres; orthographic projection of solids in section; development of surfaces of solids; method of isometric projection.

References:

1. N. D. Bhatt, Engineering Drawing, 53rd ed. Anand, India: Charotar Publishing House, 2016.
2. Basant Agrawal and C M Agrawal, Engineering Drawing, 2nd ed. New Delhi, India: McGraw Hill Education (India), 2014.

ZZ1003D BASIC ELECTRICAL SCIENCES

Pre-requisites: Nil

L	T	P	C
3	0	0	3

Total hours: 39

Course Outcomes:

CO1: Design simple resistive circuits for various applications in Electrical and Electronics engineering.
CO2: Design simple magnetic circuits and inductive components for signal and power processing.

CO3: Carry out design verification calculations, power and power loss calculations, voltage drop calculations etc. in single phase ac circuits.

CO4: Analyze Amplifiers and Digital Circuits in terms of critical parameters and complexity.

CO5: Design sub modules for systems/ Solutions for real life problems using suitable sensors /transducers, amplifiers, data converters and digital circuits.

Module 1: (11 hours)

Analysis of Resistive Circuits:

v-i relationship for Independent Voltage and Current Sources

Solution of resistive circuits with independent sources- Node Voltage and Mesh Current Analysis, Nodal Conductance Matrix and Mesh Resistance Matrix and symmetry properties of these matrices

Source Transformation and Star-Delta / Delta-Star Conversions to reduce resistive networks

Circuit Theorems - Superposition Theorem, Thevenin's Theorem, Norton's Theorem and Maximum Power Transfer Theorem.

Magnetic Circuits:

MMF, Magnetic Flux, Reluctance, Energy stored in a Magnetic Field, Solution of Magnetic Circuits.

Two Terminal Element Relationships:

Inductance - Faraday's Law of Electromagnetic Induction, Lenz's Law, Self and Mutual Inductance, Inductances in Series and Parallel, Mutual Flux and Leakage Flux, Coefficient of Coupling, Dot Convention, Cumulative and Differential Connection of Coupled Coils.

Capacitance – Electrostatics, Capacitance, Parallel Plate Capacitor, Capacitors in series and parallel, Energy stored in Electrostatic Field, v-i relationship for Inductance and Capacitance

Module 2: (9 hours)

Single Phase AC Circuits:

Alternating Quantities - Average Value, Effective Value, Form and Peak factors for square, triangle, trapezoidal and sinusoidal waveforms.

Phasor representation of sinusoidal quantities - phase difference, Addition and subtraction of sinusoids, Symbolic Representation: Cartesian, Polar and Exponential forms.

Analysis of AC circuits - R, RL, RC, RLC circuits using phasor concept, Concept of impedance, admittance, conductance and susceptance.

Power in single phase circuits - instantaneous power, average power, active power, reactive power, apparent power, power factor, complex power, solution of series, parallel and series parallel a.c circuits.

Module 3 (11 hrs)

Sensors and Transducers:

principles of piezoelectric, photoelectric, thermoelectric transducers, thermistors, strain gauge, LVDT, etc, Measurement of temperature, pressure, velocity, flow, pH, liquid level, etc.

Basics of Signal Amplification:

(Explanation based on two port models is only envisaged) – voltage gain, current gain and power gain, amplifier saturation, types of amplifiers (voltage, current, transconductance and transresistance

amplifiers) and relationship between these amplifier models, frequency response of amplifiers, single time constant networks.

Operational amplifier basics:

Ideal op-amp, inverting, noninverting, summing and difference amplifiers, integrator, differentiator.

Module 4 (8 hrs)

Digital Electronics:

Review of number systems and Boolean algebra, Logic Gates and Truth Tables, Simplification of Boolean functions using Karnaugh map (upto 4 variable K-maps), Implementation of Simple combinational circuits (Adder, Code Converters, 7-Segment Drivers, Comparators, Priority Encoders, etc) - MUX-based implementation of combinatorial circuits , Sequential circuits: SR,JK, T and D filpflops, counters and registers using D flip flops, Basics of data converters (at least one ADC and DAC).

References:

1. J.W. Nilsson and S.A. Riedel, *Electric Circuits*, 8th ed., Pearson, 2002
2. K.S. Suresh Kumar, *Electric Circuits & Networks*, Pearson Education, 2009
3. C. A. Desoer and E. S. Kuh, *Basic Circuit Theory*, McGraw Hill, 2009
4. J. A. Edminister, *Electric Circuit Theory*, Schaum's Outline series: 6th ed., McGraw Hill, 2014
5. A. D.Helfrick and W. D.Cooper, *Modern Electronic Instrumentation and Measurement Techniques*, Prentice Hall of India, 2003
6. A. S. Sedra and K. C. Smith, *Microelectronics*, 6thed.,Oxford University Press, 2013
7. C.H. Roth and L. L. Kinney, *Fundamentals of Logic Design*,7thed., Cengage Learning,2014

ZZ1004D COMPUTER PROGRAMMING

Pre-requisites: Nil.

L	T	P	C
2	0	0	2

Total hours: 26

Course Outcomes:

CO1: Design of algorithms for simple computational problems.

CO2: Express algorithmic solutions in the C programming language.

Module 1: (10 hours)

Data Types, Operators and Expressions: Variables and constants - declarations - arithmetic and logical operators – Assignment operator – Input/Output.

Control Flow: Statements and blocks – if-else, switch, while, for and do-whilestatements – break and continue – goto and labels.

Module 2: (08 hours)

Functions and Program structure: Basics of functions, Parameter passing – scope rules – recursion.

Module 3: (08 hours)

Aggregate data types: Single and multidimensional arrays, structures and unions – Pointers to arrays

and structures – passing arrays and pointers as arguments to functions.

References:

1. B.S. Gottfried, *Programming with C (Schaum's Outline Series)*, 2nd ed. McGraw-Hill,1996.

2. B. W. Kernighan and D. M. Ritchie, *The C Programming Language*, 2nd ed. Prentice Hall, 1988.

3. W. Kernighan, *The Practice of Programming*, Addison-Wesley, 1999.

BT1001D INTRODUCTION TO LIFE SCIENCE

Pre-requisites: Nil

L	T	P	C
2	0	0	2

Total hours: 26

Course Outcomes:

CO1: Comprehend the chemical and molecular basis of life.

CO2: Summarize about the basic molecules of life- proteins, lipids, DNA, and RNA

CO3: Develop idea about cell, its structure, functions and significance of compartmentalization

CO4: Students will describe the concepts in ecology and biodiversity and its impact on global change

Module 1: (09 hours)

Origin and evolution of life, Biogenesis and Louis Pasteur, Oparin-Haldane hypothesis, Darwin's view on natural selection.unity and diversity of life, Chemistry of life, introduction to structure and function of the biological macromolecules like carbohydrates, proteins, lipids, DNA and RNA

Module 2: (09 hours)

Prokaryotic and eukaryotic cells,structure and organization of cells, intracellular compartmentalization, functions of various organelles. Extracellular components and cell-cell communication,overview of Mitosis and Meiosis,basic concepts in energy transformation and photosynthesis.

Module 3: (08 hours)

Principles of Mendelian inheritance and chromosomal basis of heredity, linked genes, genetic disorder.Ecosystems and restoration ecology, energy flow, chemical and nutrient cycling, primary production in ecosystems, conservation of biodiversity.

References:

1. L. A. Urry, M. L. Cain, S. A. Wasserman, P. V. Minorsky, and J. B. Reece, *Campbell Biology*, 11[th]Edn.Pearson 2017

2. D. L. Nelson, and M. M. Cox, *Lehninger Principles of Biochemistry*, 4[th]Edn, WH Freeman and Company, 2005.

3. C. Starr, C. Evers, L. Starr, *Biochemistry, Biology: Concepts and Applications*, 10[th]Edn, 2017.

4. J.M. Berg, J.L. Tymoczko, and L. Stryer, *Biochemistry*, 6[th]Edn., WH Freeman and Company, 2007.

5. H. Lodish, A. Berk, C. A. Kaiser, and M. Krieger, *Molecular Cell Biology*, 6[th]Edn.,W. H. Freeman, 2007.

PH1091D PHYSICS LAB

Pre-requisites: Nil

L	T	P	C
0	0	2	1

Total hours: 26

Course Outcomes:

CO1: Develop experimentation skills and   understand   importance of measurement   practices in Science & Technology.

CO2: Develop analytical skills for interpreting data and drawing inferences.

CO3: Estimate the nature of experimental errors and practical means to obtain errors in acquired data.

CO4: Develop skills for team work and technical communication and discussions.

CO5: Apply theoretical principles of modern physics   to analysis and   measurements   performed in the laboratory.

LIST OF EXPERIMENTS
1. Magnetic Hysteresis loss - Using CRO
2. Band gap using four probe method
3. Hall effect- determination of carrier density, Hall coefficient and mobility
4. Solar cell characteristics
5. Double refraction – measurement of principle refractive indices.
6. Measurement of N.A & Attenuation
7. Measurement of e/m of electron – Thomson's experiment
8. Determination of Planck's constant
9. Measurement of electron charge – Millikan oil drop experiment
10. Determination of magnetic field along the axis of the coil
11. Newton's rings
12. Laurent's Half shade polarimeter –determination of specific rotatory power
13. Study of P-N junction
14. Study of voltage-current characteristics of a Zener diode.
15. Laser – measurement of angle of divergence & determination of λ using grating
16. Measurement of magnetic susceptibility- Quincke's Method / Gouy's balance.
17. Mapping of magnetic field
18. Temperature measurement by using thermocouple

NOTE: Any 8 experiments have to be done.

References:

1. A.C. Melissinos, J. Napolitano, Experiments in Modern Physics,Academic Press (2003)
2. Avadhanulu, Dani and Pokley, Experiments in Engineering physics, S. Chand & Company ltd (2002).
3. S.L. Gupta and V. Kumar, Practical physics, Pragathi Prakash (2005)

CY1094D CHEMISTRY LAB

Pre-requisites: Nil

L	T	P	C
0	0	2	1

Total hours: 26

Course Outcomes:

CO1: Acquire practical knowledge on the separation of mixtures and their identification
CO2: Understand chirality and the specific rotation of a compound
CO3: Attain practical experience in the synthesis of new molecules
CO4: Apply different techniques to quantitatively determine the amount of components

List of Experiments:
1. Determination of specific rotation by polarimetry
2. Potentiometric titrations
3. Estimation of ions using complexometry
4. Determination of strength of an acid using pH meter
5. Analysis of organic and inorganic compounds
6. Conductometric titrations using acid or mixture of acids
7. Separation of compounds using chromatography
8. Colorimetric estimations
9. Determine the eutectic temperature and composition of a solid two component system
10. Synthesis of organic/inorganic compounds and their characterizations
11. Determination of molecular weight of polymers

   Note: Selected experiments from the above list will be conducted

References:
1. G. H. Jeffery, J. Bassett, J. Mendham and R.C. Denny, *Vogel's Text Book of Quantitative Chemical Analysis*, Longmann Scientific and Technical, John Wiley, New York,1989.
2. A. I. Vogel, *Elementary Practical Organic Chemistry – Small Scale Preparations*, Pearson India, New Delhi, 2011.
3. A. I. Vogel, A. R. Tatchell, B. S. Furnis, A. J. Hannaford and P. W. G. Smith, *Vogel's Text Book of Practical Organic Chemistr*y, Longman and Scientific Technical, New York, 1989.

ZZ1091D WORKSHOP I

Pre-requisites: Nil

L	T	P	C
0	0	3	2

Total hours: 39

Course Outcomes:

CO1: Perform experiments to ascertain the quality requirements and quality testing procedures of selected building material, viz., cement, fine aggregate, coarse aggregate, concrete, timber and steel.
CO2: Identify and evaluate various driver characteristics as driver of a vehicle.
CO3: Acquire knowledge about basic civil engineering practices of brick masonry, plumbing and surveying.
CO4: Perform wiring estimation and costing for simple building/commercial electrical wiring systems.
CO5: Use commonly employed wiring tools and lighting and wiring accessories.
CO6: Adopt electrical safety measures in using and servicing household appliances.

Civil Engineering Workshop (24 hours)
1. Introduction to Surveying – Linear measurements – Hands on session on Setting out of a small residential building.
2. Introduction to Levelling – Hands on sessions using Dumpy level – Levelling exercise.
3. Introduction to Total Station – Hands on sessions - small exercises.
4. Tests on cement and aggregates: Demonstration of standard consistency, initial and final setting time of cement - Hands on sessions - Compressive strength test on cement mortar cubes and sieve analysis for coarse and fine aggregates.
5. Tests on hardened concrete, brick, timber and steel: Demonstrations on hardness tests (Rockwell hardness), impact tests (Charpy and Izod) on steel specimens-demonstration on properties of timber – Hands on sessions - Compression test on concrete cubes, bricks and tension test on mild steel specimen.
6. Masonry: Hands on sessions - English bond, Flemish bond – wall junction – one brick – one and a half brick - Arch construction.
7. Water supply and sanitation: Study of water supply pipe fittings – tap connections – sanitary fittings
8. Various tests on Driver characteristics – Visual acuity and colour blindness, peripheral vision, depth perception, driver reaction time.

Electrical Engineering Workshop(15 hours)

1. (a) Familiarization of wiring tools, lighting and wiring accessories, various types of wiring systems.
   (b) Wiring of one lamp controlled by one switch.
2. (a) Study of Electric shock phenomenon, precautions, preventions,Earthing.
   (b) Wiring of one lamp controlled by two SPDT Switches and one 3 pin plug socket independently.
3. (a) Familiarization of various types of Fuses, MCBs, ELCBs, etc.
   (b) Wiring of fluorescent lamp controlled by one switch with ELCB & MCB.
4. (a) Study of estimation and costing of wiring.
   (b) Wiring, control and maintenance of domestic appliances like Mixer machine, Electric Iron, fan, motor, etc.

References:

1. T.P. Kanetkar, S.V. Kulkarni, *Surveying and Levelling - Part1*, Pune VidyarthiGrihaPrakashan, Pune, 1994.
2. B.C. Punmia, *Building Construction*, Laxmi Publications, New Delhi1999.
3. SatheeshGopi, R. Sathikumar, N. Madh, *Advnaced Surveying*, Pearson Education,2007.
4. M.S. Shetty, *Concrete Technology*, S. Chand & Company, New Delhi,2005.
5. K. B. Raina & S. K. Bhattacharya, *Electrical Design Estimating and costing*, New Age International Publishers, New Delhi, 2005.
6. Khanna, S. K., and Justo, C. E. G., *Highway Engineering*, Nemchand and Bros, Roorkee,2001.
7. Uppal S. L., *Electrical Wiring & Estimating*, Khanna Publishers---5th edition, 2003.
8. John H. Watt, *Terrell Croft American Electricians' Handbook: A Reference Book for the Practical Electrical Man*, 9th ed. McGraw-Hill, 2002.

ZZ1092D WORKSHOP II

Pre-requisites: Nil

L	T	P	C
0	0	3	2

Total hours: 39

Course Outcomes:

CO1: Ability to select suitable material for a given purpose applying knowledge of material properties and processing.

CO2: Ability to use measuring devices like Vernier Calipers, Micrometers, etc.

CO3: Ability to fabricate simple components using basic manufacturing processes like Casting, Forming, Joining and Machining.

CO4: Ability to sequence various operations so as to execute the task within minimum time.

CO5: Perform diagnostic measurements using analog and digital meters for troubleshooting electronic systems.

CO6: Select appropriate electronic components for a given design task and assemble the prototype on breadboard.

CO7: Troubleshoot electronic boards used in various household appliances.

CO8: Perform cost estimation and costing of PCB soldering and carry out the soldering.

Mechanical Engineering Workshop (24 hours)

The course is intended to expose the student to various manufacturing processes through hands on training in different sections of Central Workshop. During the course, the student learns the properties and selection of different materials and acquires the skill in using various tools and measuring devices.

1. Carpentry: Study of tools and joints –plaining, chiseling, marking and sawing practice, one typical joint-Tee halving/Mortise and Tenon/Dovetail

2. Fitting: Study of tools- chipping, filing, cutting, drilling, tapping, about male and female joints, stepped joints. Edge preparation for single V joint.

3. Welding: Study of arc and gas welding, accessories, joint preparation. Welding of a single V joint

4. Smithy: Study of tools. Forging of square or hexagonal prism/chisel/bolt

5. Foundry: Study of tool and preparation. Moulding practice using the given pattern.

6. Sheet Metal: Study of tools, selection of different gauge sheets, types of joints. Fabrication of atrayorafunnel
7. Machine Shop: Study of the basic lathe operations. Simple step turning exercise.

Electronics Engineering Workshop (15 hours)

1. (a) Familiarization of electronic components, colour code, multimeters.
    (b) Bread board assembling-Common emitter amplifier.
2. (a) Study of soldering components, solders, tools, heat sink.
    (b) Bread board assembling-phase shift oscillator.
3. (a) Soldering practice-Common emitter amplifier.
    (b) Soldering practice-Inverting amplifier circuit.
4. (a) Study of estimation and costing of soldering PCB, 3 phase connections.
    (b) PCB wiring and fault Identification of appliances like Electronic Ballast, fan regulator, inverter, UPS, etc.

References:

1. W. A. J. Chapman, Workshop Technology - Parts 1 & 2, 4th ed. New Delhi, India, CBS Publishers & Distributors Pvt. Ltd., 2007.
2. Welding Handbook. 9th ed. Miami, American Welding Society, 2001.
3. J. Anderson, Shop Theory, New Delhi, India, Tata McGraw Hill, 2002.
4. J. H. Douglass, Wood Working with Machines, Illinois, McKnight & McKnight Pub. Co., 1995.
5. W.A. Tuplin, Modern Engineering Workshop Practice, Odhams Press, 1996.
6. P. L. Jain, Principles of Foundry Technology, 5th ed. New Delhi, India, Tata McGraw Hill, 2009.
7. John H. Watt, Terrell Croft, American Electricians' Handbook: A Reference Book for the Practical Electrical Man, 9th ed. McGraw-Hill, 2002.
8. G. Randy Slone, Tab Electronics Guide to Understanding Electricity and Electronics, 2nd ed. McGraw-Hill, 2000.
9. Jerry C Whitaker, The Resource Handbook of Electronics, CRC Press-2001.

ZZ1093D PHYSICAL EDUCATION

Pre-requisites: Nil

L	T	P	C
1	0	1	1

Total hours: 26 (13 L +13 P)

Course Outcomes:

CO1: Select a game/ activity of his/ her choice to pursue on the campus to enjoy/ entertain and thereby develop good health and fitness which he/she would carry over to post-campus life for maintaining health, fitness and wellness.

CO2: Be more proficient in a game, which may lead him/her to a berth in the institute teams.

CO3: Gain exposure to professional training, so as to enable him / her to excel in sports activities.

CO4: Participate in intramural and open mass participation activities.

CO5: Participate and organise in-campus or off-campus sports activities.

UNIT – I - Introduction, definition, aims & objectives of Physical Education.Health, Physical fitness and wellness.Importance, scope and relevance of Physical Education in NITC curriculum.

UNIT – II - Physical fitness and components. Health related Physical fitness and components. Benefits of exercise – physical and physiological.

UNIT – III - Physical exercise and its principles.Activities for developing physical fitness – walking, jogging, running, weight training, stretching, yogasanas.Athletic injuries and their management.Nutritional balance.

UNIT – IV - Motivation and its importance in sports.Stress, anxiety, tension, aggression in sports.Personality, self-confidence and performance.Team cohesion and leadership in sports.

UNIT – V - Lifestyle diseases and its management, Diabetes and Obesity, Hypertension, Osteoporosis

Coronary heart diseases and cholesterol.Backpain, Postural deformities and their remedies.

UNIT – VI. - Olympic Values Education. Event & Crisis management.

References

1. Najeeb, A. M., Atul, M., Sumesh, D. and Akhilesh, E. *Fitness Capsule for university curriculum*, 2015

ZZ1094D VALUE EDUCATION

Pre-requisites: Nil

L	T	P	C
1	0	1	1

Total hours: 26 (13 L +13 P)

Course Outcomes:

CO1: Identify the purpose of education and the problems faced by mankind, in terms of socio economic and environmental issues.

CO2: Describe the social and intellectual needs to transform the society to a better one where everyone meets the basic economic and social security, freedom and atmosphere to live a meaningful life.

CO3: Practise a meaningful life avoiding all kinds of corrupt practices and develop unconditional love, universal brotherhood and simulate international peace and prosperity.

CO4: Persuade others to practise a righteous life, which would stimulate a synergy of universal harmony and peace.

CO5: Create an ideal society where everyone enjoys the fruits of love, peace and harmony.

Unit I (2 hours): **Social Justice** Definition –need-parameters of social justice –factors responsible for social injustice –caste and gender –contributions of social reformers.

Unit II (3 hours)**: Human Rights and Marginalized People** Concept of Human Rights-Principles of human rights-human rights and Indian Constitution-Rights of Women and children-violence against women–Rights of marginalized People-like women, children, dalits, minorities, physically challenged etc.

Unit III (3 hours): **Social Issues and Communal Harmony** Social issues–causes and magnitude-alcoholism, drug addiction, poverty, unemployment etc.-communal harmony-concept-religion and its place in public in public domain-separation of religion from politics-secularism role of civil society.

Unit IV (3 hours): **Media Education and Globalized World Scenario** Mass media-functions-characteristics-need and purpose of media literacy-effects and influence –youth and children-media power-socio cultural and political consequences mass mediated culture-consumerist culture-Globalization-new media –prospects and challenges-Environmental ethics

Unit V (2 hours): **Values and Ethics** Personal values –family values-social values-cultural values-professional values-and overall ethics-duties and responsibilities

Project: 13 hours

References:

1. Sharma, B. K., *Human Rights Covenants and Indian Law*, PHI Learning Pvt. Ltd, 2010
2. Law Commission of India, (1971), *Indian Penal code*, (http://lawcommissionofindia.nic.in/1-50/report42.pdf), accessed on February 14, 2018.
3. Srivastava, S. S., *Central Law Agency's Indian Penal Code along with General Principles (IPC)*, Central Law Agency, 2017
4. *Gandhiji on Communal Harmony*,Mani Bhavan Gandhi Sangrahalaya', Mumbai, 2003
5. *Social Impact of Drug Abuse*, UNDCP, ((https://www.unodc.org/pdf/technical_series_1995-03-01_1.pdf, accessed on February 14, 2018).
6. Bryfonski, D., *The Global Impact of Social Media*, Green Heaven Publications**,** 2012
7. Schmidtz, D. &Willott, E., *Environmental Ethics: What Really Matters, What Really Works*, Oxford University Press, 2012
8. Ranganathanda, S., *Eternal Values for a Changing Society: Education for human excellence*, BharatiyaVidyaBhavan, 1987
9. Rokeach, M., *Understanding human values: Individual and Societal*, The New Free Press, 1979

ZZ1095D NATIONAL SERVICE SCHEME

Pre-requisites: Nil

L	T	P	C
0	0	3	1

Total hours: 39

Course Outcomes:

CO1: Acquire awareness in social and environmental issues thereby improving social consciousness and commitment towards the community.

CO2: Participate in socially relevant activities that are aimed at betterment of the campus and the society, thereby instilling a helpful attitude

CO3: Develop a positive attitude towards dignity of labour, self-help and the need for combining physical work with intellectual pursuits.

CO4: Improve inter-personal skills and contribute to nation building by serving the local community, thereby promoting a healthy and positive attitude towards life.

NSS activities have been divided in two major groups. These are Regular NSS Activities and Special Camping programme.

(a) Regular NSS Activity: NSS volunteers undertake various activities in adopted villages and slums for community service. The NSS units organise the regular activities as detailed below:

i) Orientation of NSS volunteers: To get the NSS volunteers acquainted with the basics of NSS programmes, for their orientation through lectures, discussions, field visits, audio-visuals etc.

ii) Campus Work: The NSS volunteers may be involved in the projects undertaken for the benefit of the institution and students concerned. Such projects cover maintenance of public properties, tree plantation, waste management and Swach Bharat activities, conservation of water and energy sources, social audits, awareness programmes on drug-abuse, AIDS, population education, and other projects

iii) Community service will be in adopted villages/urban slums independently or in collaboration with others in this field.

iv) Institutional work: The students may be placed with selected voluntary organisations working for the welfare of women, children, aged and disabled outside the campus.

v) Rural Project: The rural projects generally include the working of NSS volunteers in adopted villages for e-governance and digital literacy, watershed management and wasteland development, rainwater harvesting, agricultural operations, health, nutrition, hygiene, sanitation, mother and child care, gender equality sensitization programmes, family life education, gender justice, development of rural cooperatives, savings drives, construction of rural roads, campaign against social evils etc.

vi) Urban Projects: In addition to rural projects other include adult education, welfare of slum dwellers, work in hospitals, orphanages, destitute home, environment enrichment, population education, drug, AIDS awareness, and income generation,

vii) National Days and Celebrations: The National Service Scheme programmes also include the celebration of National days. The purpose of such a provision is to celebrate such occasions in a befitting manner,

viii) Blood Donation Activities,

ix) Campus farming activities,

x) Activities for social inclusion such as organizing programmes for differently – abled children.

Students shall volunteer and contribute to the activities of the National Service Scheme for a minimum duration of 39 hours for the award of credit.

b) Special Camping Programme: Under this, camps of 7 days' duration are organised during vacations with some specific projects by involving local communities.

4. TIME TABLE FOR FIRST SEMESTER

TIMETABLE FOR 1ST SEMESTER B.Tech./ B.Arch. – MONSOON SEMESTER 2019

BRANCH	BATCH / SLOT	A	B	C	D	E	F	G	P	Q	R	S	T	U/UA	TUE (G & E)	WED (A & F)	FRI (A & F)
CE1	A / ECLC A	ZZ1002D	MA1001D B, H(Wed)	PH1001D		ZZ1003D	BT1001D		ZZ1091D (A1)	ZZ1091D (A2)	ZZ1002D	ZZ1093D	PH1091D				
CSE1	B / ECLC B A, A+	MA1001D A, A+	PH1001D	ZZ1002D	ZZ1003D	BT1001D			ZZ1093D (B1)	PH1091D (B2)	ZZ1091D (B1)	ZZ1091D (B2)	ZZ1002D				
EEE1	C / ECLC C	ZZ1002D	BT1001D		ZZ1003D	BT1001D			ZZ1091D (C1)	ZZ1002D (C2)	ZZ1093D	ZZ1002D (C2)	ZZ1091D (C2)				
ECE1	D / ECLC D	PH1001D	ZZ1002D	ZZ1002D	BT1001D	BT1001D ZZ1003D	MA1001D D, A+		PH1091D (D1)	ZZ1091D (D2)	ZZ1002D (D2)	ZZ1002D (E1)	ZZ1093D				
ME1	E / ECLC E	PH1001D	PH1001D	PH1001D	BT1001D	BT1001D ZZ1003D	MA1001D F, E+		ZZ1091D (E1)	ZZ1091D (E2)	PH1091D	ZZ1002D (E1)	ZZ1091D (E2)	PH1091D (E2)	PH1091D (E1)		
CH PE1	F / ECLC F	ZZ1003D	ZZ1003D	BT1001D	BT1001D	ZZ1002D	PH1001D	MA1001D G, H(Wed)	ZZ1091D (F1)	ZZ1091D (F2)	PH1091D	ZZ1002D	ZZ1093D				
BIO MT PH1	G / MAT402		MA1001D B, B+	MS1001D	ZZ1003D	MA1001D E, E+		BT1001D G (Tue,Thu)	ZZ1092D (H1)	ZZ1092D (H2)	ZZ1091D (G1)	ZZ1002D (G2)	ZZ1002D (G batch)			PH1091D (G1)	PH1091D (G2)
CE2	H / ECLC H	CY1001D	MA1001D B, B+	CY1001D		MS1001D	ZZ1004D		ZZ1092D (H1)	ZZ1092D (H2)	CY1094D	ZZ1093D					
CSE2	J / ECLC J A, A+	MA1001D A, A+	CY1001D	CY1001D	MS1001D	ZZ1001D			CY1094D (J1)	ZZ1092D (J1)	ZZ1092D (J2)	ZZ1092D (J2)	ZZ1093D				
EEE2	K / ECLC K	ZZ1004D		MA1001D C, G+	ZZ1001D	MS1001D			ZZ1092D (K1)	CY1094D	ZZ1093D	ZZ1092D (K2)	ZZ1092D (K2)				
ECE2	L / ECLC L	ZZ1001D	ZZ1004D	ZZ1004D	CY1001D	CY1001D			ZZ1093D	CY1094D (L1)	CY1094D (L2)	CY1094D					
ME2	M / ECLC M A, F+	MA1001D A, F+	ZZ1004D	ZZ1001D	ZZ1001D	MS1001D			ZZ1092D (M1)	ZZ1092D (M2)	CY1094D	ZZ1092D (M1)	ZZ1092D (M2)	CY1094D (M2)	CY1094D (M1)		
CH PE2	N / ECLC N	MS1001D	ZZ1001D	ZZ1001D	MS1001D				ZZ1092D (N1)	ZZ1092D (N2)	ZZ1093D	ZZ1092D (M1)					
ARCH	ARCH. (AB302)	MS1001D	MS1001D	AP1002D HOA	MA1003D D, D+	MA1003D D, D+	AP1001D AG		AP1003D IAD	AP1091D FA	AP1001D BD	AP1003D IAD	AP1092D WS				

Course Legend

Code	Course
MA1001D	Mathematics I
PH1001D	PHYSICS
CY1001D	CHEMISTRY
MS1001D	PROFESSIONAL COMMUNICATION
ZZ1001D	ENGINEERING MECHANICS
ZZ1002D	ENGINEERING GRAPHICS
ZZ1004D	COMPUTER PROGRAMMING
ZZ1003D	BASIC ELECTRICAL SCIENCES
BT1001D	INTRODUCTION TO LIFE SCIENCES
ZZ1091D	WORKSHOP I
ZZ1092D	WORKSHOP II
PH1091D	PHYSICS LABORATORY
CY1094D	CHEMISTRY LABORATORY
ZZ1093D	PHYSICAL EDUCATION
AP1001D	Architectural Graphics I
AP1002D	History of Architecture I
AP1003D	Introduction to Architectural Design I
AP1091D	Fine Arts
AP1092D	Workshop

5. INSTITUTE SLOTS

For Theory Courses

DAY	8.00 – 9.00	9.00 – 10.00	10.15-11.15	11.15-12.15	1.00 – 2.00	2.00 - 3.00	3.00 – 4.00	4.00 – 5.00	5.00 – 6.00
	1	2	3	4	5	6	7	8	9
MON	A	F	D	B	G	E+	-	-	H
TUE	B	G	E	C	A+	F+	-	-	H
WED	C	A	F	D	H	G+	-	-	E@
THU	D	B	G	E	-	C+	-	-	G@
FRI	E	C	A	F	H+	B+	-	-	D+

Note: E@ and G@ are substitute slots for E and G in case U or UA is allotted for Laboratory courses.

Laboratory Courses

DAY	8.00 – 9.00	9.00 – 10.00	10.15-11.15	11.15-12.15	12.15-1.15	2.00 - 3.00	3.00 – 4.00	4.00 – 5.00	5.00 – 6.00
	1	2	3	4	5	6	7	8	9
MON	-	-	-	-	-	P			-
						PA		PB	
TUE	-	-	-	-	-	Q			-
						QA		QB	
WED	-	-	-	-	-	R			-
						RA		RB	
THU	-	-	U			S			-
			UA		-	SA		SB	
FRI	-	-	-	-	-	T			-
						TA		TB	

6. ACADEMIC CALENDAR for Monsoon Semester 2019-2020 (Approved by the 71st Meeting of the Senate)

Bold numbers 1 to 65 indicate instructional days including Test

Days	July 2019 Date	Class	August 2019 Date	Class	September 2019 Date	Class	October 2019 Date	Class	November 2019 Date	Class	December 2019 Date	Class
Sun					1						1	
Mon	1				2	28					2	
Tues	2				3	29	1	Test			3	
Wed	3				4	30	2 Gandhi Jayanthi				4	
Thu	4		1	8	5	31	3	Test			5	
Fri	5		2	9	6	32	4	Test	1	TE5	58	6	Result Decln
Sat	6		3		7		5		2		7	
Sun	7	SV (F) ends	4		8		6		3		8	
Mon	8		5 Add/ Drop courses	10	9	33	7 Mahanavami		4	PR1	59	9	
Tues	9		6	11	10 Muharram*		8 Vijayadasami		5	PR2	60	10	
Wed	10		7	12	11 Thiruvonam		9	42	6	PR3	61	11	
Thu	11		8	13	12	34	10	43	7	PR4	62	12 Make up / ReExam	
Fri	12		9	14	13	35	11	44	8	PR5	63	13 Make up / ReExam	
Sat	13		10		14		12		9		14	
Sun	14		11		15		13		10 Milad ul Nabi		15	
Mon	15		12 Id Ul Zuha (Bakrid)*		16	36	14	45	11	64	16 Make up / ReExam	
Tues	16		13	15	17	37	15	46	12 Guru Nanak Jayanthi		17 Make up / ReExam	
Wed	17		14	16	18	38	16	47	13 Class Ends**/ Appln for Condn	65	18 Make up / ReExam	
Thu	18		15 Independence day		19	39	17	48	14 List of Condonation		19	
Fri	19		16	17	20	40	18 Tathva		15 End Sem		20	
Sat	20		17		21 Convocation		19 Tathva		16 End Sem		21	
Sun	21		18		22		20 Tathva		17		22	
Mon	22 Regn		19	18	23	41	21	49	18 End Sem		23 Results of Make up / Reexam	
Tues	23 Classes start	1	20	19	24	Test	22	50	19 End Sem		24	
Wed	24	2	21	20	25	Test	23	51	20 End Sem		25 Christmas	
Thu	25	3	22	21	26	Test	24	52	21 End Sem		26 Regn for Winter Sem	
Fri	26	4	23	22	27	Test	25	53	22 End Sem		27 Classes start	
Sat	27		24		28	Test	26 PTA Meeting (First Year)		23 End Sem		28	
Sun	28		25		29		27 Deepavali		24		29	
Mon	29 Late Regn	5	26	23	30	Test	28 TE1	54	25 End Sem		30	
Tues	30	6	27	24			29 TE2	55	26		31	
Wed	31	7	28	25			30 TE3	56	27			
Thu			29	26			31 TE4	57	28			
Fri			30	27					29			
Sat			31						30			

1	Regn: Enrollment for all UG, PG, PhD and Probation students	22-Jul-19
2	First Instructional Day	23-Jul-19
3	Late Registration	29-Jul-19
4	Add/drop Courses	5-Aug-19
5	Last Instructional Day	13-Nov-19
6	TE 1: Teacher Evaluation for All PG, PhD & MCA	28-Oct-19
7	TE 2: Teacher Evaluation for All Seventh Sem B.Tech and Seventh & Ninth Semester B.Arch	29-Oct-19
8	TE 3: Teacher Evaluation for All First Semester B.Tech/B.Arch	30-Oct-19
9	TE 4: Teacher Evaluation for All Third Semesters B.Tech & B.Arch	31-Oct-19
10	TE 5: Teacher Evaluation for All Fifth Semesters B.Tech & B.Arch	1-Nov-19
11	(PR1) - Pre-Registration for Current First and Third Semester M.Tech / 9th. Sem B.Arch.	4-Nov-19
12	(PR2) - Pre-Registration for Current Third and Fifth sem. MCA/M.Sc./PhD	5-Nov-19
13	(PR3) - Pre-Registration for Current Seventh sem. B.Tech/B.Arch:	6-Nov-19
14	(PR4) - Pre-Registration for Current Fifth sem. B.Tech./B.Arch:	7-Nov-19
15	(PR5) - Pre-Registration for Current Third sem B.Tech./B.Arch.	8-Nov-19
16	Application for Condonation	13-Nov-19
17	List of Condonation	14-Nov-19
18	End Result Declaration	6-Dec-19
19	* Subject to change depending on sighting of the moon	12-Aug-19 / 10-Sep-19
20	**Instructional day with Tuesday's day order	13-Nov-19

CONTACT DETAILS

National Institute of Technology
NIT Campus PO, Calicut - 673 601
Kerala, India Fax: 0495 2287250
Website: http://www.nitc.ac.in
Telephone: 0495 2286101

DIRECTOR
Telephone: 0495 2286100
Email: director@nitc.ac.in

DEAN (ACADEMIC)
Telephone: 0495 2286103
Email: dao@nitc.ac.in

PG ADMISSIONS
Chairperson, PG Admissions
Telephone: 0495 2286119
Email: pgadmissions@nitc.ac.in

UG ADMISSIONS
Chairperson, UG Admissions
Telephone: 0495 2286110
Email: ugadmissions@nitc.ac.in

Admission Office: 0495 2286118

NITC HOSTELS

Chief Warden	:	0495	2286951
Hostel Manager	:	0495	2287238
A Hostel	:	0495	2286961, 2287285
B Hostel	:	0495	2286962, 2287286
C Hostel	:	0495	2286963, 2287273
D Hostel	:	0495	2286964, 2287213
E Hostel	:	0495	2286965, 2287287
F Hostel	:	0495	2286966, 2287211
G Hostel	:	0495	2286967
PG Hostel I	:	0495	2286968, 2287284
PG Hostel II	:	0495	2286969
International Hostel	:	0495	2286970
Ladies Hostel I	:	0495	2286971, 2287251
Ladies Hostel II	:	0495	2286972
Ladies Hostel III	:	0495	2286973, 2287151
GUEST HOUSE	:	0495	2287247

The statements made in this Information Bulletin and all other information, contained herein are believed to be correct at the time of publication. However, the Institute reserves the right to make, at any time without notice, changes in and additions to the regulations, conditions governing the conduct of students, requirements for degree, fees and any other information, or statements contained in this Information Bulletin. No responsibility will be accepted by the institute for hardship or expense encountered by its students or any other person for such changes, additions, omissions or errors, no matter how they are caused.

Cover Design: MK Chandra Mohanan

राष्ट्रीय प्रौद्योगिकी संस्थान कालिकट

National Institute of
Technology Calicut